

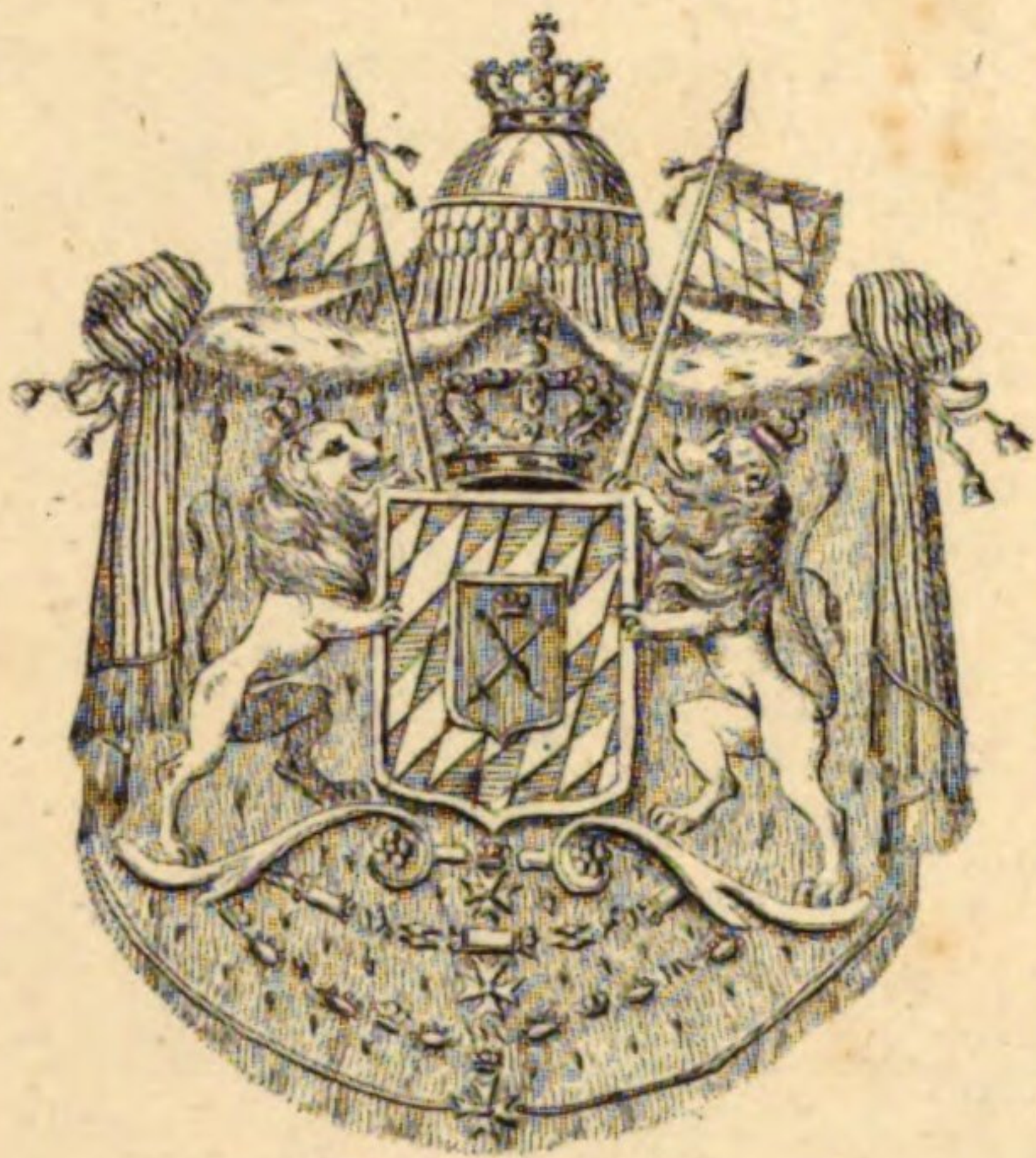
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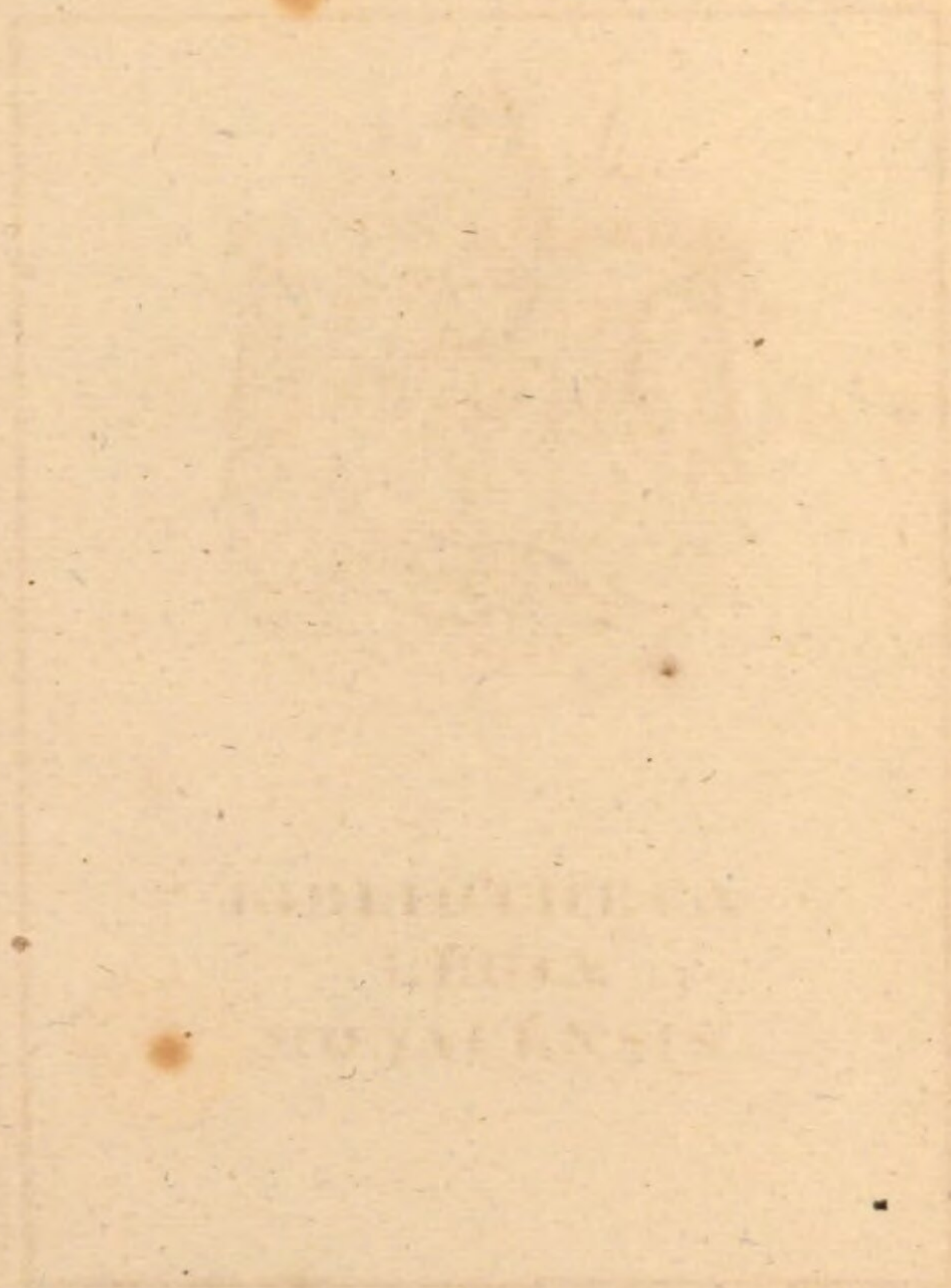


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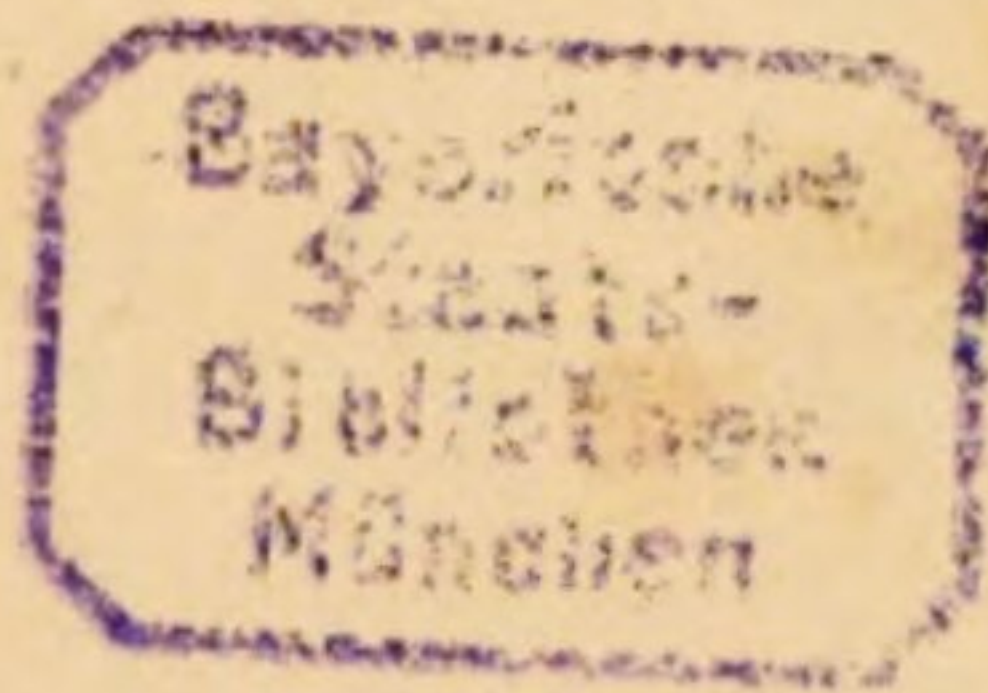
BY J. H. H. H. H.

Nat. med. 121 ^m - 2

AMERICAN

MEDICAL BOTANY.

VOLUME I.—PART II.



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VOLUME I.—PART II.

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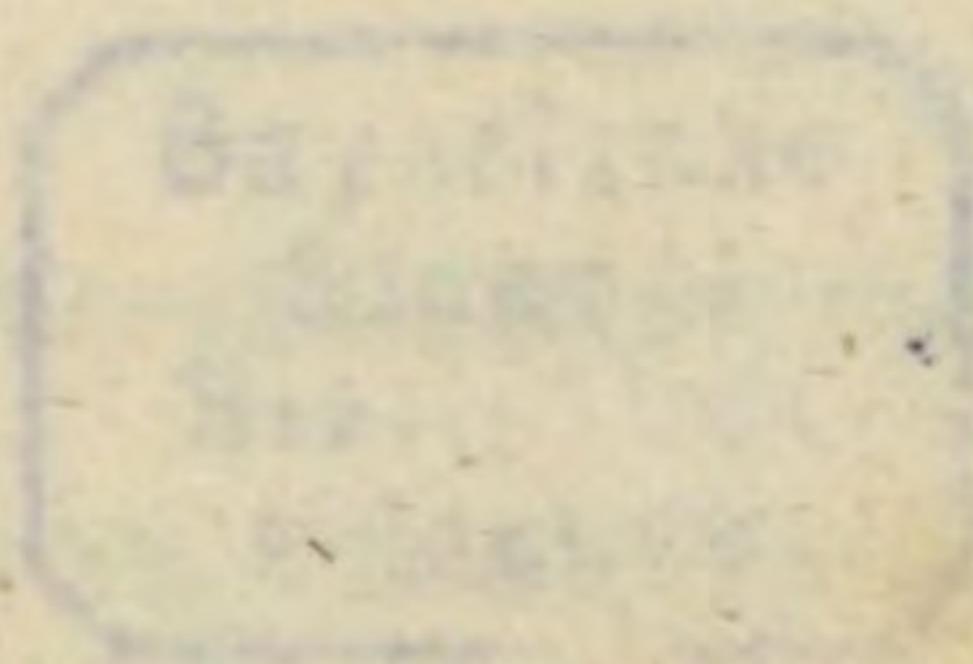
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MEDICAL BOTANY

JOHN H. MANN



Conium maculatum



AMERICAN

MEDICAL BOTANY

ONCHUS MACULATUS

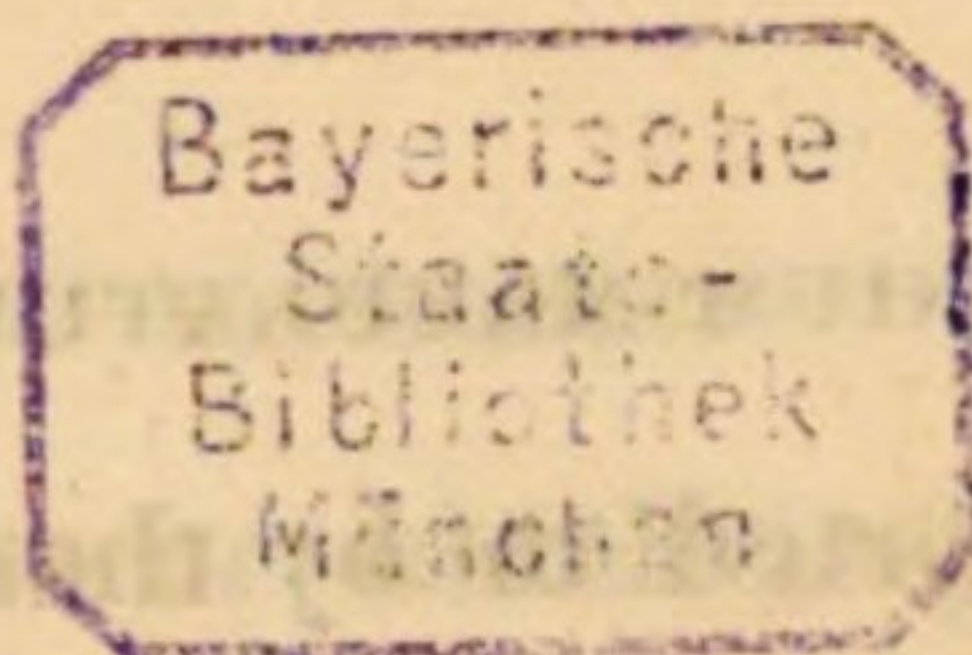
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A. maculatus, the root of the *Onchus*, has been used as a powerful emetic and purgative. In consequence of the power which it possesses when given in sufficient quantities, of destroying life in a certain and almost immediate manner, it was used as a means of execution for those condemned to death by the sentence of the law. Socrates and many others among the distinguished ancients, who suffered death by the agency of this mortal poison. The accounts which have been left respecting it would lead us to believe that its operation was speedy, and unattended with any violent or long protracted suffering. It was not only employed as an instrument of public execu-

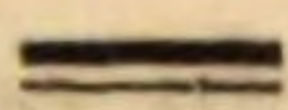


Pinnatifid fern



AMERICAN

MEDICAL BOTANY.



CONIUM MACULATUM.

Hemlock.

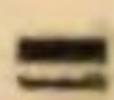


PLATE XI.

A PLANT bearing the name of *Conium*, *κωνειον*, has been noted as a poison from remote antiquity. In consequence of the power which it possessed when given in sufficient quantities, of destroying life in a certain and almost immediate manner, it was used at Athens as a mode of execution for those condemned to death by the tribunal of Areopagus. Socrates and Phocion were among the distinguished ancients, who suffered death by the agency of this mortal poison. The accounts which have been left respecting it would lead us to believe that its operation was speedy, and unattended with any violent or long protracted suffering. It was not only employed as an instrument of public execu-

tions, but was resorted to by those who sought to encounter suicide in its least formidable shape. Among other instances, that of the Cean old men is related by Ælian, who when they had become useless to the state, and tired of the infirmities of life; invited each other to a banquet, and having crowned themselves as in celebration of a joyous festival; drank the Conium, and terminated their existence together.

The description which has been left by Dioscorides of the Conium, only shews it to have been an umbellate plant, his character of which might apply to many species. The mention made of it by Latin writers under the name of *Cicuta* are not more satisfactory. Linnæus, influenced by the noxious character of the modern officinal Hemlock, has appropriated to that plant the name of the Grecian species, and most subsequent botanists have followed his example. Haller, however, is of opinion that the ancient poison was not procured from this plant, but from the *Cicuta virosa* L. a poisonous aquatic, much more powerful and violent in its operation than the common Hemlock. Lamarck adopts the opinion of Linnæus, and believes that the Conium maculatum was really the Grecian poison, and that its properties were rendered more active by the

heat of the climate in which it grew. Guersent supposes that the poisonous draught used by the Greeks was not the product of a single species, but a compound prepared from several plants.

Were it not for the tranquillity and ease which attended death from the ancient hemlock, and which Plato has described with interesting minuteness, there would not have been much difficulty in supposing the Grecian plant to be the same with that known at the present day. [Note H.] It appears that a large quantity was requisite to insure death. The poison was swallowed in the crude juice, recently expressed from the plant. Of this the draught taken by Phocion was large enough to cost twelve *drachmæ*.* Socrates was prevented from making a libation of a part of the contents of his fatal cup, by being told that the whole was necessary to produce the consummation of his sentence. A large quantity of the modern hemlock might probably have been equally fatal, though with more violent symptoms than those which, if Plato be correct, were experienced by the Athenian philosopher.

The plant, represented in our plate, undoubtedly came to us from Europe. It is now sufficiently common in the United States, about road

* Plutarch, Life of Phocion.

sides and in waste ground, especially in those parts of the country which have been longest settled. It is usually found in bunches, and attains the full height of a man. It flowers from June until the arrival of frost.

The very natural order, called Umbellatæ by Linnæus and Umbelliferæ by Jussieu, to which this plant and the following one belong, is found in the class Pentandria and order Digynia of the Linnæan artificial method.

The genus *Conium* of Linnæus has *both general and partial involucre*s, the latter being *halved*. The fruit *roundish and furrowed*.

The species *maculatum* has the fruit *unarmed with the ridges undulated*.

Its more complete description is as follows. Root biennial, somewhat fusiform and generally branched. Stalk round, very smooth, striated, hollow, jointed, and more or less marked with purplish spots. Leaves two or three times pinnate, of a very bright green, with long, sheathing petioles inserted on the joints of the stem; the leaflets pinnatifid and toothed. Flowers in terminal umbels, the general involucre with half a dozen lanceolate, reflected leaflets, the partial involucre with three or four situated on the outside. Flowers very small, white. Petals five, oval with their

points inflexed. Stamens five, spreading, about the length of the corolla. Germ inferior. Styles two reflexed outwardly. Fruit roundish-oval, compressed, ribbed, the ribs being transversely wrinkled or crenate; separating into two oblong-hemispherical seeds.

Hemlock when fresh has a strong nauseous odour and taste. If the green leaves are distilled, the water which collects in the receiver has an insupportably nauseous taste, while that which remains in the retort is comparatively insipid. This circumstance, and likewise the fact that the dried leaves become inert by age and exposure, render it probable that the chief medicinal efficacy resides in a volatile portion of the plant. Of the more fixed ingredients of Hemlock, a variety of analyses have been made. The most recent which I have met with is that of Schrader, who from a thousand grains of the plant obtained the following substances. Extractive 27.3—Gummy extract 35.2—Resin 1.5—Albumen 3.1—Green fæcula 8.—He also detected various earthy and alkaline salts. These however are found to vary according to the soil in which the plant grows. The volatile portion, which I obtained in water distilled from the leaves, did not exhibit any essential oil, and effected no change in the colour of litmus. It

was not altered by sulphate of iron nor acetite of lead.

The *Conium maculatum* is a narcotic poison, though not of the most powerful kind. Instances of fatal effects from it have been recorded by Dr. Watson in the *Philosophical Transactions*, and by several other writers. A remarkable case of this sort, which occurred in Spain, is cited by Orfila in his *Traité des poisons*. But there is scarcely any narcotic plant respecting the character of which such various and opposite testimony has been adduced by medical writers. Even the experiments of the same individual are apt to present different results from its use, unless great care be taken in the collection and preparation of the medicine. The truth is, the plant varies exceedingly at different ages, and in different places of growth, and the strength of its preparations is greatly influenced by external circumstances.

When the green leaves of a mature plant which has grown in the sun, or the juice of these leaves, either crude, or properly inspissated, is taken into the stomach; the following symptoms, if the quantity has been sufficient, will rarely fail to take place; viz. a dizziness of the head and nausea of the stomach, a sense of fullness in the eyes and diminished power of vision, together with

a general faintness or muscular weakness of the whole body. These sensations usually begin in the course of half an hour. If the dose has been moderate, they will for the most part disappear in the course of half a day, and seldom continue beyond twenty four hours. Larger doses occasion more severe symptoms, as it happens with other narcotics.

The idiosyncrasies of different persons render them variously susceptible of the action of Hemlock. Some are but slightly affected by a quantity, which would prove dangerous to others.

The Hemlock has been for many years a subject of attention with physicians, and has been found a remedy of importance in several diseases. It would occupy a volume to state the whole of the evidences which have been given for and against its use. I shall only mention those complaints in which it has been most employed, and particularly in this country.

In Jaundice.—Dr. Fisher, President of the Massachusetts Medical Society, in his paper on the narcotic vegetables, bears unequivocal testimony in favour of the efficacy of Hemlock in this complaint. He was first induced to employ it with a view to its relaxing effect in facilitating the passage of biliary calculi. Afterwards it was

given by him to many icteric patients, and with the exception of three complicated cases, it never failed in his hands or within his knowledge to remove the disease. Dr. Jackson, Professor of the Theory and Practice of Physic in our University, informs me that he has found it of great utility in jaundice, and that except in one or two instances, it has always effected the cure of those cases, which proved susceptible of relief from any medicine. I have repeatedly employed it in the same complaint with indubitable advantage. The dose should be gradually increased until its effects are distinctly felt in the head and stomach. This inconvenience is temporary, and will be preferred by most patients to the evil of a mercurial ptyalism. The yellowness of the skin and eyes, in favourable cases, begins to disappear at an early period, frequently by the second day.—The foregoing practice in jaundice is not new, having been employed in Sweden by Rosenstein, and in other places.

In *tic dolooureux*. In a discourse on this painful disease by Dr. Jackson, published in the New England Journal, Vol. II. a number of cases are detailed, in which perfect relief was afforded by the Hemlock given in large doses, and rapidly increased until a decided effect upon the system was

felt. Dr. Jackson recommends to begin with a single grain of the extract, and to increase to five grains for the second or third dose ; afterwards to add five grains to every dose until a full effect is felt on the system. In this discourse he cites the experience of Dr. Fothergill, who had employed the Conium successfully in several cases of this disease under a different name. It appears also that some French physicians, whose writings I have not seen, as Chaussier and Duméril, have confirmed the success of our plant in *tic douloureux*. It must be confessed however, although the Hemlock is more successful in this complaint than perhaps any internal medicine, which has been tried ; yet there are cases of such obstinacy, as wholly to baffle the powers of its operation.

In schirrus and cancer. Since the time of Storck, this medicine has been long and abundantly tried, but without any increase of reputation. The experience of modern physicians, and among others of M. Alibert, who tried it in more than a hundred cases in the hospital of St. Louis, have pretty well established the fact, that it is wholly incapable of curing either schirrus or cancer of the confirmed and genuine kind. It is however still administered, rather with a view to its anodyne and palliative effect, than any expectation of radical ben-

efit. In this way its external use is sometimes serviceable.

In old syphilitic affections, it is occasionally useful. It has been recommended in whooping cough, but it is not a perfectly safe medicine for children, owing to the difficulty of ascertaining when its constitutional effects take place in them.—I am informed on the best medical authority, that it is of great use in some cases of hemicrania, which are not regularly intermittent.

The most common form of preserving the Hemlock for use, as well as the most convenient for its exhibition, is that of the inspissated juice or extract. It is well known however, that the extracts kept in our shops differ materially in their strength, so that in beginning from a new parcel, the physician can seldom predict the degree of operation of his first doses. In some instances very great quantities have been taken without the least effect. The extract is apt to prove inert when the plant is gathered too young, when the evaporation is conducted with too much heat, when a decoction of the dried plant has been evaporated instead of the fresh leaves, and lastly when the extract itself has become old. To give the extract its due strength, the plant should be collected at full maturity, while in flower, or in fruit provided it remains green, and

the juice or the decoction should be evaporated at the heat of boiling salt water. The stock should be renewed every year. A suitable dose for commencement is from one to five grains. This may be increased at every time of taking it, until its constitutional effects are felt. In beginning the use of a new parcel, more caution is requisite at first, than after its strength has been tested.

The *Æthusa cynapium*, an umbellate plant very common in Boston, has sometimes been mistaken for Hemlock, which it considerably resembles. It is a smaller plant, with its stalk not spotted. It differs also in having no general involucre, while its partial one is very long.

BOTANICAL REFERENCES.

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PLATE XI.

Fig. 1. *A branch of Conium maculatum.*

Fig. 2. *Flower magnified.*

Fig. 3. *Fruit magnified.*





Cicuta maculata

EMETICA SIMULATA

Emeticum Simulatum

PLATE III

It is a rule, suggested by the experience of medical botanists, that poisonous plants, which grow in or about the water, are of a poisonous nature. This rule will generally be found correct, although it has exceptions. As to the aquatic plants of this natural order, few have attracted their properties, in a great majority of instances, have been found, more or less of a deleterious kind. The third species of this order is a highly poisonous plant, possessing such powerful activity that its internal use is hardly to be regarded as moderate. An American species, the *Theriac. ascendata*, the subject of this article, is very closely allied in its botanical habit to the European plant, and was equally deserving of suspicion from its appearance, although the public were not generally aware of its true character. Within a few years past, several



Cirsium maculatum

CICUTA MACULATA.

American Hemlock.

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PLATE XII.

It is a rule sanctioned by the observations of medical botanists, that umbelliferous plants, which grow in or about the water, are of a poisonous nature. This rule will generally be found correct, although it has exceptions. As far as aquatic plants of this natural order have been examined, their properties, in a great majority of instances, have been found, more or less of a deleterious kind. The *Cicuta virosa* of Europe is a highly poisonous plant, possessing such formidable activity that its internal use is hardly attempted in medicine. An American species, the *Cicuta maculata*, the subject of this article, is very closely allied in its botanical habit to the European plant, and was equally deserving of suspicion from its appearance, although the public were not generally aware of its true character. Within a few years past, several

instances have been brought to light of fatal effects ensuing from this plant being incautiously eaten by children. It is therefore necessary that the species should be suitably designated, that a source of so much danger may be known and avoided.

The *Cicuta maculata*, to which I have applied the name of *American Hemlock*, not having heard any common appellation except that of *Snakerweed*, inhabits wet meadows and banks, from the northern to the southern limits of the United States, flowering in July and August. It is so frequently cut with hay, among which it often grows in large quantities, that we might expect to see its deleterious properties operating on domestic cattle, were it not that their bodies are probably less susceptible of its poison than ours. The European *Cicuta*, above mentioned, is highly noxious to man, and to some domestic animals, yet goats and sheep eat it with impunity.

The genus *Cicuta* differs from other genera of umbellate plants in having *no general involucre*, a short, partial involucre, and a *fruit* which is nearly *orbicular, compressed and furrowed*.*

* This description of the fruit agrees with the present species and also with *Cicuta bulbifera*, a smaller species not uncommon about Boston. The *Cicuta virosa* of Europe I have never seen.

The species *maculata* has a fascicled root and oblong leaves with mucronate serratures.

The class and orders are as in the last article.

This plant is so remarkable for the form of its root, that had not the name of *maculata* been confirmed to me by the best authorities, I should have thought that of *fasciculata* to be greatly preferable. This root is composed of a number of large, oblong, fleshy tubers, diverging from the base of the stem, and frequently being found of the size and length of the finger. The root is perennial, and has a strong, penetrating smell and taste. In various parts of the bark it contains distinct cells or cavities, which are filled with a yellowish resinous juice. The plant is from three to six feet high. Its stem is smooth, branched at top, hollow, jointed, striated, and commonly of a purple colour, except when the plant grows in the shade, in which case it is green. The leaves are compound, the largest being about three times pinnate, the uppermost only ternate. Most of the petioles are furnished with long obtuse stipules, which clasp the stem with their base. Leaflets oblong acuminate, serrate, the serratures very acute or mucronated. The veins end in the notches, and not at the points of the serratures. The flowers grow in umbels of a middling size, without a general invo-

lucre. The partial umbels are furnished with involucre of very short, narrow, acute leaflets. The distinctness or separation of these umbels characterizes this plant at a distance among other plants of its kind, whose umbels are more crowded. Calyx of five very minute segments. Petals five, white, obovate with inflected points. Fruit nearly orbicular, compressed, ten furrowed, crowned at top, and separating into two semicircular seeds.

The fleshy root of the *Cicuta maculata*, when pressed, emits from its divided extremities a viscid yellowish juice of a strong penetrating taste. This juice dissolves in alcohol, from which it is precipitated by water. When distilled, a thick volatile oil collects in the receiver in the form of a film upon the surface of the water. The remainder of the juice yields a resin of a dark orange colour, fusible and inflammable. The decoction of the root affords a pearl coloured fluid, not very sensible to the tests of mucus, fæcula, tannin or extractive.

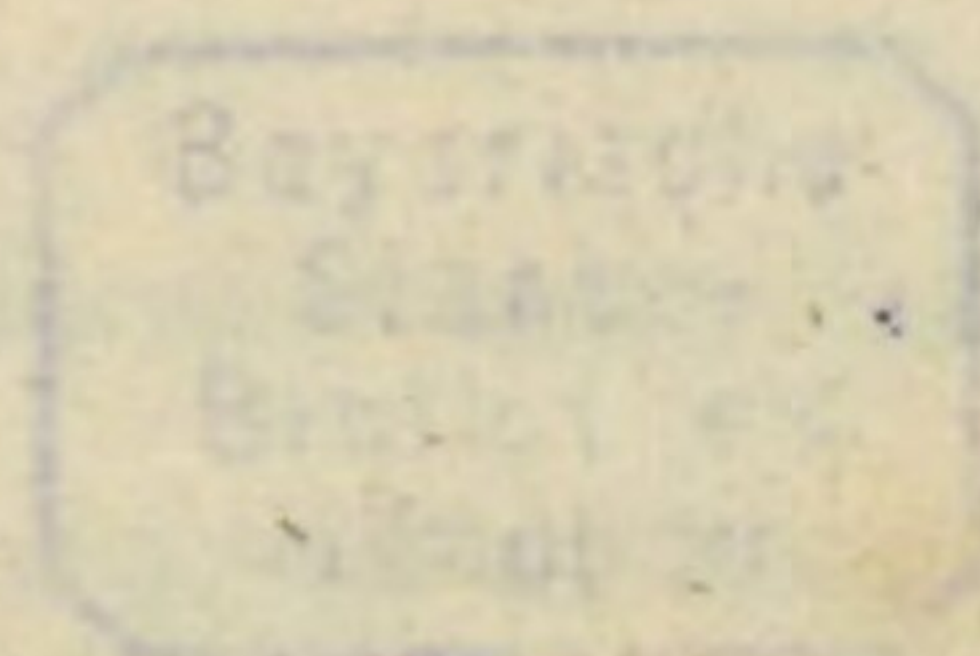
In August 1814, an account was sent to Boston by Dr. Stockbridge of Bath (Maine) of the effect produced on three boys by eating a poisonous root, which they had dug up, supposing it to belong to the plant called "Life of man." One of them was siezed with violent convulsions, frothed

at the mouth, and died in an hour and a half. The other two were affected with vomiting, stupor, dilatation of the pupil, great paleness and universal distress ; which symptoms disappeared in one in twenty four, and in the other in thirty six hours. It was supposed that the first boy had swallowed about a drachm of the root, and the others about half that quantity. A specimen of the plant was sent to me at the same time with the account, and proved to be the *Cicuta maculata*. Dr. Stockbridge's letter, which was published in the New England Journal, contains two other cases of the effect of this root, in one of which it proved fatal.

Shortly after the publication of the above facts, an article appeared in the New York Medical Repository, containing an account by Dr. Ely of Dutchess county, of the effects of an unknown poisonous root, supposed to be the white hellebore. Three small boys, who had gone into a meadow in search of sweet flag root, had dug up and eaten another root by mistake. Two of them died in convulsions in about an hour after they had swallowed it. They discharged much blood and froth from the mouth and nose ; their eyes were fixed, with the pupils dilated, and a rapid motion of the eye lids. The third boy vomited, and recovered. When taken to the place the next



Conium maculatum



AMERICAN

MEDICAL BOTANY.

CONIUM MACULATUM.

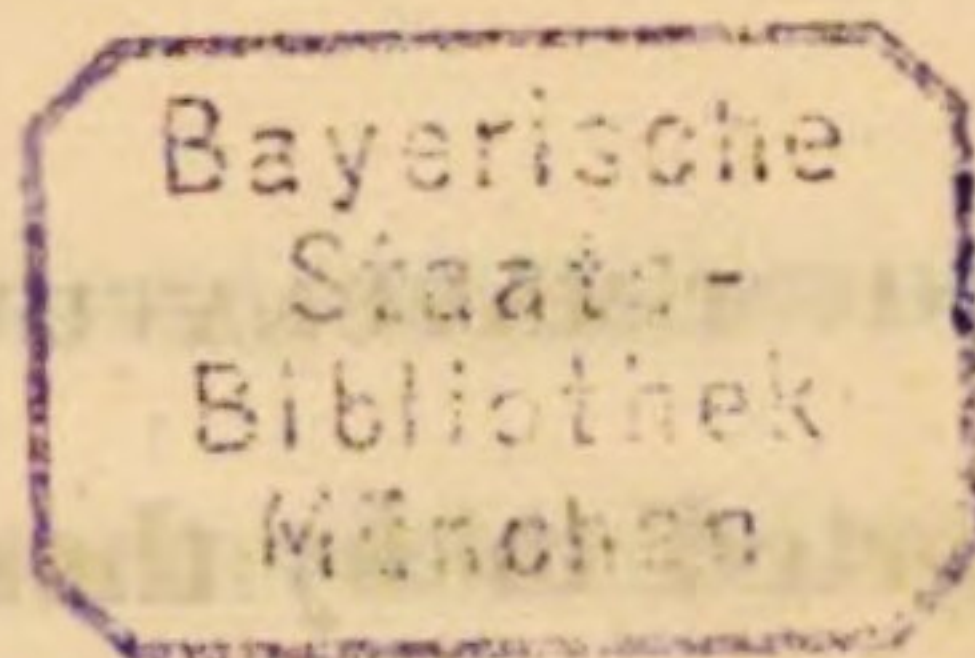
Hemlock.

PLATE XL

A plant bearing the name of *Conium maculatum*, has been noted as a poison from remote antiquity. In consequence of the power which it possessed when given in sufficient quantities, of destroying life in a certain and almost immediate manner, it was used by the ancients as a mode of execution for those condemned to death by the tribunal of Areopagus. Socrates and Phocion were among the distinguished ancients, who suffered death by the agency of this mortal poison. The accounts which have been left respecting it would lead us to believe that its operation was speedy, and unattended with any violent or long protracted suffering. It was not only employed as an instrument of public execu-

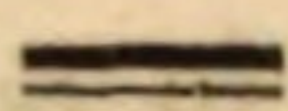


Cnicus maculatus



AMERICAN

MEDICAL BOTANY.



CONIUM MACULATUM.

Hemlock.

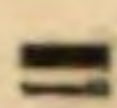


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The idiosyncrasies of different persons render them variously susceptible of the action of Hemlock. Some are but slightly affected by a quantity, which would prove dangerous to others.

The Hemlock has been for many years a subject of attention with physicians, and has been found a remedy of importance in several diseases. It would occupy a volume to state the whole of the evidences which have been given for and against its use. I shall only mention those complaints in which it has been most employed, and particularly in this country.

In Jaundice.—Dr. Fisher, President of the Massachusetts Medical Society, in his paper on the narcotic vegetables, bears unequivocal testimony in favour of the efficacy of Hemlock in this complaint. He was first induced to employ it with a view to its relaxing effect in facilitating the passage of biliary calculi. Afterwards it was

given by him to many icteric patients, and with the exception of three complicated cases, it never failed in his hands or within his knowledge to remove the disease. Dr. Jackson, Professor of the Theory and Practice of Physic in our University, informs me that he has found it of great utility in jaundice, and that except in one or two instances, it has always effected the cure of those cases, which proved susceptible of relief from any medicine. I have repeatedly employed it in the same complaint with indubitable advantage. The dose should be gradually increased until its effects are distinctly felt in the head and stomach. This inconvenience is temporary, and will be preferred by most patients to the evil of a mercurial ptyalism. The yellowness of the skin and eyes, in favourable cases, begins to disappear at an early period, frequently by the second day.—The foregoing practice in jaundice is not new, having been employed in Sweden by Rosenstein, and in other places.

In *tic dolooureux*. In a discourse on this painful disease by Dr. Jackson, published in the New England Journal, Vol. II. a number of cases are detailed, in which perfect relief was afforded by the Hemlock given in large doses, and rapidly increased until a decided effect upon the system was

felt. Dr. Jackson recommends to begin with a single grain of the extract, and to increase to five grains for the second or third dose ; afterwards to add five grains to every dose until a full effect is felt on the system. In this discourse he cites the experience of Dr. Fothergill, who had employed the Conium successfully in several cases of this disease under a different name. It appears also that some French physicians, whose writings I have not seen, as Chaussier and Duméril, have confirmed the success of our plant in *tic douloureux*. It must be confessed however, although the Hemlock is more successful in this complaint than perhaps any internal medicine, which has been tried ; yet there are cases of such obstinacy, as wholly to baffle the powers of its operation.

In schirrus and cancer. Since the time of Storck, this medicine has been long and abundantly tried, but without any increase of reputation. The experience of modern physicians, and among others of M. Alibert, who tried it in more than a hundred cases in the hospital of St. Louis, have pretty well established the fact, that it is wholly incapable of curing either schirrus or cancer of the confirmed and genuine kind. It is however still administered, rather with a view to its anodyne and palliative effect, than any expectation of radical ben-

efit. In this way its external use is sometimes serviceable.

In old syphilitic affections, it is occasionally useful. It has been recommended in hooping cough, but it is not a perfectly safe medicine for children, owing to the difficulty of ascertaining when its constitutional effects take place in them.—I am informed on the best medical authority, that it is of great use in some cases of hemicrania, which are not regularly intermittent.

The most common form of preserving the Hemlock for use, as well as the most convenient for its exhibition, is that of the inspissated juice or extract. It is well known however, that the extracts kept in our shops differ materially in their strength, so that in beginning from a new parcel, the physician can seldom predict the degree of operation of his first doses. In some instances very great quantities have been taken without the least effect. The extract is apt to prove inert when the plant is gathered too young, when the evaporation is conducted with too much heat, when a decoction of the dried plant has been evaporated instead of the fresh leaves, and lastly when the extract itself has become old. To give the extract its due strength, the plant should be collected at full maturity, while in flower, or in fruit provided it remains green, and

the juice or the decoction should be evaporated at the heat of boiling salt water. The stock should be renewed every year. A suitable dose for commencement is from one to five grains. This may be increased at every time of taking it, until its constitutional effects are felt. In beginning the use of a new parcel, more caution is requisite at first, than after its strength has been tested.

The *Æthusa cynapium*, an umbellate plant very common in Boston, has sometimes been mistaken for Hemlock, which it considerably resembles. It is a smaller plant, with its stalk not spotted. It differs also in having no general involucre, while its partial one is very long.

BOTANICAL REFERENCES.

Conium Maculatum, LINNÆUS, *Sp. Pl.*—WOODVILLE, *t.* 22.—CURTIS, *Fl. Lond.* i. 17.—SMITH, *Engl. Bot.* *t.* 1191.—PURSH, i. 195.—*Cicuta vulgaris*, MORISON, *Umb.* *t.* 6.—PARKINSON, *Theatr.* 933.—*Cicuta major*, LAMARCK, *Encyclopedie Methodique*.—*Cicutaria vulgaris*, CLUSIUS, *Hist.* 200.

MEDICAL REFERENCES.

MURRAY, *Apparatus medicaminum*, i. 322.—CULLEN, *Mat. Med.* ii. 263.—FOTHERGILL, *Med. Obs.* iii. 400.—HUNTER on the venereal, 108, 175, 199, 247, &c.—HOME, *Annals Med.* iii. 66.—BUTTER, *Med. Comment.* i. 373.—FISHER, *Mem. Mas. Soc.* i.—JACKSON, *N. Engl. Journ.* ii. 105.—GUERSENT. *Dict. Sciences Medicales*, v. 208.—ORFILA, *Toxicologie*, iii. 279, &c. &c. &c.

PLATE XI.

Fig. 1. *A branch of Conium maculatum.*

Fig. 2. *Flower magnified.*

Fig. 3. *Fruit magnified.*





Cicuta maculata

It is a common error to suppose that the introduction of
new plants into a country is a matter of indifference, which
greatly affects the health of the community. It is not so.
The introduction of a new plant, even though it be a native
of the island, may have serious consequences. Their
properties, in a great majority of instances, have
been found, more or less, of a deleterious kind.
The *Cereus strictus* of Europe is a highly poisonous
plant, possessing such a powerful activity that its
internal use is hardly admissible in medicine. An
American species, the *Cereus peruvianus*, the sub-
ject of this article, is very closely allied in its ho-
tanical habit to the European plant, and was equal-
ly deserving of suspicion from its appearance, al-
though the public were not generally aware of its
true character. Within a few years past, several



Cicuta maculata

CICUTA MACULATA.

American Hemlock.

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PLATE XII.

IT is a rule sanctioned by the observations of medical botanists, that umbelliferous plants, which grow in or about the water, are of a poisonous nature. This rule will generally be found correct, although it has exceptions. As far as aquatic plants of this natural order have been examined, their properties, in a great majority of instances, have been found, more or less of a deleterious kind. The *Cicuta virosa* of Europe is a highly poisonous plant, possessing such formidable activity that its internal use is hardly attempted in medicine. An American species, the *Cicuta maculata*, the subject of this article, is very closely allied in its botanical habit to the European plant, and was equally deserving of suspicion from its appearance, although the public were not generally aware of its true character. Within a few years past, several

instances have been brought to light of fatal effects ensuing from this plant being incautiously eaten by children. It is therefore necessary that the species should be suitably designated, that a source of so much danger may be known and avoided.

The *Cicuta maculata*, to which I have applied the name of *American Hemlock*, not having heard any common appellation except that of *Snakeweed*, inhabits wet meadows and banks, from the northern to the southern limits of the United States, flowering in July and August. It is so frequently cut with hay, among which it often grows in large quantities, that we might expect to see its deleterious properties operating on domestic cattle, were it not that their bodies are probably less susceptible of its poison than ours. The European *Cicuta*, above mentioned, is highly noxious to man, and to some domestic animals, yet goats and sheep eat it with impunity.

The genus *Cicuta* differs from other genera of umbellate plants in having *no general involucre*, a short, partial involucre, and a *fruit* which is nearly *orbicular, compressed and furrowed*.*

* This description of the fruit agrees with the present species and also with *Cicuta bulbifera*, a smaller species not uncommon about Boston. The *Cicuta virosa* of Europe I have never seen.

The species *maculata* has a fascicled root and oblong leaves with mucronate serratures.

The class and orders are as in the last article.

This plant is so remarkable for the form of its root, that had not the name of *maculata* been confirmed to me by the best authorities, I should have thought that of *fasciculata* to be greatly preferable. This root is composed of a number of large, oblong, fleshy tubers, diverging from the base of the stem, and frequently being found of the size and length of the finger. The root is perennial, and has a strong, penetrating smell and taste. In various parts of the bark it contains distinct cells or cavities, which are filled with a yellowish resinous juice. The plant is from three to six feet high. Its stem is smooth, branched at top, hollow, jointed, striated, and commonly of a purple colour, except when the plant grows in the shade, in which case it is green. The leaves are compound, the largest being about three times pinnate, the uppermost only ternate. Most of the petioles are furnished with long obtuse stipules, which clasp the stem with their base. Leaflets oblong acuminate, serrate, the serratures very acute or mucronated. The veins end in the notches, and not at the points of the serratures. The flowers grow in umbels of a middling size, without a general invo-

lucre. The partial umbels are furnished with involucre of very short, narrow, acute leaflets. The distinctness or separation of these umbels characterizes this plant at a distance among other plants of its kind, whose umbels are more crowded. Calyx of five very minute segments. Petals five, white, obovate with inflected points. Fruit nearly orbicular, compressed, ten furrowed, crowned at top, and separating into two semicircular seeds.

The fleshy root of the *Cicuta maculata*, when pressed, emits from its divided extremities a viscid yellowish juice of a strong penetrating taste. This juice dissolves in alcohol, from which it is precipitated by water. When distilled, a thick volatile oil collects in the receiver in the form of a film upon the surface of the water. The remainder of the juice yields a resin of a dark orange colour, fusible and inflammable. The decoction of the root affords a pearl coloured fluid, not very sensible to the tests of mucus, fæcula, tannin or extractive.

In August 1814, an account was sent to Boston by Dr. Stockbridge of Bath (Maine) of the effect produced on three boys by eating a poisonous root, which they had dug up, supposing it to belong to the plant called "Life of man." One of them was siezed with violent convulsions, frothed

at the mouth, and died in an hour and a half. The other two were affected with vomiting, stupor, dilatation of the pupil, great paleness and universal distress ; which symptoms disappeared in one in twenty four, and in the other in thirty six hours. It was supposed that the first boy had swallowed about a drachm of the root, and the others about half that quantity. A specimen of the plant was sent to me at the same time with the account, and proved to be the *Cicuta maculata*. Dr. Stockbridge's letter, which was published in the New England Journal, contains two other cases of the effect of this root, in one of which it proved fatal.

Shortly after the publication of the above facts, an article appeared in the New York Medical Repository, containing an account by Dr. Ely of Dutchess county, of the effects of an unknown poisonous root, supposed to be the white hellebore. Three small boys, who had gone into a meadow in search of sweet flag root, had dug up and eaten another root by mistake. Two of them died in convulsions in about an hour after they had swallowed it. They discharged much blood and froth from the mouth and nose ; their eyes were fixed, with the pupils dilated, and a rapid motion of the eye lids. The third boy vomited, and recovered. When taken to the place the next

day, he pointed out the spot where they had dug the root, and where a considerable quantity of it remained. Some of the root was planted by Dr. Mitchill in the New York Hospital garden, where it vegetated and produced flowers and fruit. It turned out to be the *Cicuta maculata* of Linnæus. In the same article, is a letter from Dr. Muhlenberg, stating that he had received specimens from Savannah and from West Pennsylvania, where it had destroyed several persons, who ate it by mistake for angelica. All the specimens were similar, so that there could be no doubt of the identity of the plant. In the same letter, Dr. Muhlenberg remarks, that he had reason to believe that the poisonous quality of the root is altered by cultivation in a dry soil.

The foregoing facts are sufficient to establish the poisonous character of the plant under consideration. They may also serve to shew the importance of accurate descriptions and faithful engravings of noxious vegetables, which may enable even unlearned observers to distinguish them at sight. There can be little doubt that cases, like those above described, have occurred in repeated instances, which have never met the public eye. Perhaps also from an ignorance of the real cause of the symptoms, the proper remedies have been

neglected. The plant is extremely common in many parts of the United States, and I believe its true character is not generally suspected. A very respectable physician informed me, that it was used in his vicinity as a gargle for sore throats, by people unsuspecting of its qualities.

Since the discovery of its narcotic properties, the *Cicuta* has been used in small doses, as a substitute for the conium, by one or two practitioners in this place. Its effects were very analogous to those of the true hemlock, as far as they were observed, but more powerful. A primary symptom, which attended a large dose, was nausea and vomiting.

The treatment of persons poisoned by this plant, as in the case of other narcotics, should primarily consist in a thorough evacuation of the stomach. As there commonly exists a spontaneous tendency to vomit, occasioned by the poison itself, this should be assisted by mechanical means, by irritating the throat with the finger, or with a feather. Of emetics, the sulphate of zinc is to be preferred, on account of its speedy operation. Castor oil or infusion of senna, should be given as soon as vomiting has taken place. The vegetable acids, such as lemon juice or vinegar, have a neutralizing influence on the narcotic, and are therefore useful. Strong coffee and tea are the best an-

tidotes for the stupor, and should be promptly administered. In violent cases, bloodletting should be resorted to. As most narcotic poisons act by destroying the functions of the brain, respiration being suspended, because it is under the influence of that organ ; Mr. Brodie is of opinion, that in some cases, life might be preserved by keeping up artificial respiration, after death has apparently taken place.

BOTANICAL REFERENCES.

Cicuta maculata. LINNÆUS *Sp. pl.*—PURSH, i 195.—*Ægopodium foliis lanceolatis, acuminatis, serratis*. GRONOVIIUS, *Virg.* 32.—*Angelica Caribæarum elatior, olusatri folio ; flore albo ; seminibus luteis, striatis, cumini odore et sapore ?* PLUKENET, *Alm.* 31, *Phyt. t.* 76, *f.* 1.

MEDICAL REFERENCES.

SCHÆFF, 36.—BART. *Coll.* 18, 46.—STOCKBRIDGE, *New Engl. Journal*, iii. 334. MITCHILL, ELY and MUHLENBERG, *Med. Repository*, xvii. 303.



1.

2.



Kalmia latifolia

3.



Kalmia latifolia L.
This shrubby plant, which is a native of
Linnaeus first described it in 1745. It is one
of the most beautiful of the plants which
our country produces. The species named
Kalmia by Linnaeus, is a species of singular
beauty, among which the American lau-
rel is much the largest and most elegant, as well as
the one whose properties have been most ex-
tensively known. Its occurrence is in the United States is very
frequent, and its common appellations of course va-
rious. The names of *Laurel*, *Lambkill*, *Ivy*, *Spoon-
wood*, and *Calico bush*, it seems, are applied to it in
various parts of the country. This shrub grows in
the southern parts of New Hampshire, and is oc-
casionally met with throughout Massachusetts.
In the Middle States it becomes more frequent,



Kalimeris latifolia

KALMIA LATIFOLIA.

Mountain laurel.

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PLATE XIII.

THE Swedish botanist, Peter Kalm, a pupil of Linnæus, who travelled in North America in 1748—9, has had the honor of giving name to one of the most elegant genera of flowering shrubs which our continent produces. The genus named *Kalmia* by Linnæus, includes several species, of singular beauty, among which the Mountain laurel is much the largest and most elegant, as well as the one whose properties have received most attention. Its occurrence in the United States is very frequent, and its common appellations of course various. The names of *Laurel*, *Lambkill*, *Ivy*, *Spoonwood*, and *Calico bush*, it seems, are applied to it in various parts of the country. This shrub grows in the southern parts of New Hampshire, and is occasionally met with throughout Massachusetts. In the Middle States it becomes more frequent,

and it is said to extend near to the southern limits of the Union. Michaux, in his account of the forest trees, states, that it is particularly abundant through the whole range of Allegany mountains, upon the borders and near the sources of rivers. It gradually diminishes however on both sides as these rivers approach to the sea, or to their confluence with the great western streams.

The botanical character of the genus consists in a five parted calyx, a hypocrateriform corolla, containing ten depressions in its border, in which the anthers are lodged ; a capsule five celled.

The specific character is, that the leaves are scattered, petioled, oval and smooth ; the corymbs terminal, viscid and pubescent.

Class *Decandria*, order *Monogynia*. Natural orders *Bicornes*, Linn. *Rhododendra*, Juss.

The height of the *Kalmia latifolia* is generally that of a shrub, sometimes however attaining to the altitude of a small tree. Its leaves are evergreen, coriaceous, very smooth, with the under side somewhat palest. Their form is oval, acute and entire ; their insertion by scattered petioles, on the sides and extremities of the branches. The flowers vary from white to red ; they grow in terminal corymbs, simple or compound with opposite branches, and made up of slender peduncles. These

are invested with a glutinous pubescence, and supported at base by ovate, acuminate bractes. The calyx is small, five parted, persistent, with oval, acute segments. The corolla is monopetalous, with a cylindrical tube, a spreading disc, and an erect, five cleft margin. At the circumference of the disc on the inside, are ten depressions or pits, accompanied with corresponding prominences on the outside. In these depressions the anthers are found lodged at the time when the flower expands. The stamens originate from the base of the corolla, and bend outwardly, so as to lodge their anthers in the cells of the corolla. From this confinement they liberate themselves during the period of flowering and strike against the sides of the stigma. The germ is roundish, the style longer than the corolla and declined, the stigma obtuse. Capsule roundish, depressed, five celled and five valved, with numerous small seeds.

I have examined chemically the leaves of the *Kalmia*, gathered at the time the shrub was in fruit. The following constituent principles were found to exist in them.

1. Vegetable mucus. This exists in large quantities, and is dissolved in water both by infusion and decoction, rendering it extremely mucilaginous or ropy. When alcohol is added to this so-

lution, the mucus separates in the form of a flocculent coagulum, which is tough and stringy, and on drying has a brownish colour. When chewed, it soon fills the mouth with mucilage.

Silicated potash rendered the upper stratum of the liquid dark and opaque, but without any precipitate like that which takes place in the mucilage of gum.

2. Tannin. This is readily thrown down from the decoction and tincture by gelatin. The sulphate of iron strikes with it a very black colour.

3. Resin. This also exists plentifully. It communicates to alcohol a reddish colour, and is instantly precipitated from it by water. When obtained pure, it is of a reddish cast, fusible, inflammable and moderately bitter.

I have not detected any extractive, properly so called, in these leaves. When the muriate of tin is added to the decoction, it separates a very copious yellow precipitate. This however is owing to the mucus. If alcohol be first added to the decoction, and the coagulum which it forms withdrawn; the fluid no longer gives a precipitate with muriate of tin, although it readily yields one to gelatin.

Distillation with water affords a mild fluid with little taste or odour.

The *Kalmia latifolia*, together with some other species of its genus, has long had the reputation, in various parts of the country, of being poisonous to certain domestic animals. Catesby says of it, that "deer feed on its green leaves with impunity ; yet when cattle and sheep, by severe winters deprived of better food, feed on the leaves of this plant, a great many of them die annually."

Kalm, the Swedish traveller, who gave name to this genus, says of *Kalmia latifolia*, "The leaves are poison to some animals, and food for others ; experience has taught the people, that when sheep eat of these leaves, they either die immediately, or fall very sick, and recover with great difficulty. The young and more tender sheep are killed by a small portion, but the older ones can bear a stronger dose. Yet this food will likewise prove mortal to them, if they take too much of it. The same noxious effect it shews in regard to calves which eat too much of the leaves ; they either die, or do not recover easily. I can remember that in the year 1748 some calves ate of the leaves ; they fell very sick, swelled, foamed at the mouth and could hardly stand ; however, they were cured by giving them gunpowder and other medicines. The sheep are most exposed to be tempted with these leaves in winter, for after having been kept in sta-

bles for some months, they are greedy of all greens, especially if the snow still lies upon the ground, and therefore the green but poisonous leaves of the Kalmia are to them very tempting. Horses, oxen and cows, which have eaten them, have likewise been very ill after the meal, and though none of them ever died of eating these leaves, yet most people believed, that if they took too great a portion of them, death would certainly be the result.” “On the other hand, the leaves of the Kalmia are the food of stags, when the snow covers the ground and hides all other provisions from them. Therefore, if they be shot in winter, their bowels are found filled with these leaves, and it is very extraordinary, that if those bowels are given to dogs, they become quite stupid, and, as it were, intoxicated, and often fall so sick, that they seem to be at the point of death ; but the people who have eaten the venison have not felt the least indisposition.”—*Travels in North America*, vol. i.

There is a common belief, that the flesh of the American Pheasant or Partridge is at certain times imbued with a poisonous quality. This circumstance has been attributed (I know not with what evidence) to their feeding in winter upon the buds of the Kalmia. Mr. Wilson, the ornithologist, informs us, that he has sometimes found the

crops of these birds distended almost entirely with laurel buds ; but that he has eaten freely of the flesh of these very birds, without any ill consequence whatever.

On the human system, the *Kalmia* has been also said to manifest a deleterious influence. The late Professor Barton has adduced some evidences of its noxious character.* He states that the Indians make use of a decoction of the leaves to destroy themselves. In an Inaugural Dissertation on two species of *Kalmia*, the *latifolia* and *angustifolia*, by Dr. G. K. Thomas, we are told that the leaves of these shrubs possess a decidedly narcotic property. I have not recently seen Dr. Thomas' Dissertation, and therefore quote from memory and from extracts. From his experiments however it appeared, that a very small quantity was sufficient to produce sensible inconvenience. Thirty drops of a strong decoction, given six times a day, are said to have occasioned so much vertigo, as to render it necessary to diminish the frequency of its exhibition.

From my own experience, I am not disposed to think very highly of the narcotic power of the

* Dr. Barton states, that a few drops of the tincture poured upon the body of a large and vigorous rattlesnake, killed the reptile in a very short time.

Kalmia. I have repeatedly chewed and swallowed a green leaf of the largest size, without perceiving the least effect in consequence. I have also seen the powder, freshly made from leaves recently dried, taken in doses of from ten to twenty grains, without any subsequent inconvenience or perceptible effect. The taste of these leaves is perfectly mild and mucilaginous, being less disagreeable than that of most of our common forest leaves.

I am inclined to believe that the noxious effect of the *Kalmia* upon young grazing animals may be in some measure attributed to its indigestible quality, owing to the quantity of resin contained in the leaves.

An ointment made of the powdered leaves has been recommended in *tinea capitis* and some other cutaneous affections. I have seen an eruption, very much resembling *psora*, removed by it.

The wood of the *Kalmia* is hard and dense, approaching in its character to that of box. It is much used for the handles of mechanics' tools, &c. and it has even been employed as a material for musical instruments. As an ornamental shrub, this species stands in the highest rank, and by the frequency of its growth and the brilliancy of its flowers, it contributes in a great degree to the elegance of the natural scenery in those mountains

and woods, which it inhabits. When cultivated in gardens, it requires a soil which is somewhat moist, and a shady or northern aspect.

BOTANICAL REFERENCES.

Kalmia latifolia, LIN. *Sp. pl.*—CURTIS, *Bot. Mag.* t. 175.—MICHAUX *f. Arbres forestiers*, iii. 147, t. 5.—PURSH i. 296.—*Chamaedaphne foliis tini*, &c.—CATESBY, *Carolina*, ii. t. 98.—*Ledum floribus bullatis*, &c. TREW, t. 38.—*Cistus chamærhododendros*, &c. PLUKENET, *Phyt.* t. 379, f. 6.

MEDICAL REFERENCES.

KALM, *travels*, i. 335, &c.—BART. *Coll.* i. 18, 48; ii. 26.—THACHER, *Disp.* 247.—THOMAS, *Inaugural dissertation*.

PLATE XIII.

Fig. 1. *Branches of Kalmia latifolia with flowers and fruit.*

Fig. 2. *Stamens.*

Fig. 3. *Calyx and pistil.*

SPIGELIA MARILANDICA.

Carolina Pink root.

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PLATE XIV.

WE are told by different writers, that this fine plant is a native of all the southern states from Pennsylvania to Georgia and Louisiana, growing in rich soils, especially about the borders of woods. It does not bear the severity of a northern winter. For my living specimens I was indebted to my excellent and learned friend, the late Dr. James Macbride, of Charleston, S. C.

The genus *Spigelia* has a *funnel shaped corolla* and a *capsule, which is double, two celled and many seeded*. The species *Marilandica* is *perennial, with a simple stem and opposite leaves*.

Class *Pentandria*; order *Monogynia*. Natural orders *Stellatæ*, Lin. *Gentianæ*, Juss.

The root of the *Spigelia Marilandica* is perennial, with many fibrous branches. The stalks proceed several from a root; they are simple



RR.

Spigelia floribunda



SPIGELIA MARILANDICA.

Carolus. Pl. 1801.

We are told by numerous writers, that this fine plant is a native of all the Southern states from Pennsylvania to Georgia and Louisiana, growing in rich soils, especially about the borders of woods. It does not bear the severity of a northern winter. For my Spring specimens I was indebted to my ever-loving and learned friend, the late Dr. James M. Smith of Charleston, S. C.

The genus *Spigelia* has a funnel shaped corolla and a capsule, which is double, two celled and many seeded. The species *Marilandica* is perennial, with a single stem and opposite leaves.

Class *Polypetalae*; order *Monogynia*. Natural orders *Scrophularia*, Læ. *Gentiana*, Juss.

The root of the *Spigelia Marilandica* is perennial, with many fibrous branches. The stalks proceed several from a root; they are simple



Spigelia Marilandica

four-sided and nearly smooth. Later, opposite
 teeth and sometimes with smooth, with the
 meeting and very numerous. The
 such common to terminals in a simple one-sided
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 spines with four. The peduncles are sometimes
 is short so that the region may be short in part
 part the dominant of a spine. The peduncles
 with the peduncles, the peduncles are
 which are short so that the region may be short
 time as long as the peduncles are short
 without any short, with the tube isolated
 and angular at top, the border divided into five
 and a small region. The border is very short
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four sided and nearly smooth. Leaves opposite, sessile, ovate, acuminate, entire, smooth, with the margins and veins sometimes pubescent. The stalk commonly terminates in a simple one-sided raceme of flowers, although I have seen luxuriant specimens with two. The peduncles are extremely short, so that the raceme may without impropriety be denominated a spike. Calyx persistent, with five linear-subulate, finely serrulate leaves, which are reflexed in the ripe fruit. Corolla five times as long as the calyx, scarlet or crimson without, orange coloured within, the tube inflated and angular at top, the border divided into five acute, spreading segments. Stamens very short, inserted into the mouth of the corolla between the segments; anthers oblong-heart shaped. Germ small, superior, ovate. Style longer than the corolla, jointed near its base and bearded at the extremity. Capsule double, consisting of two, cohering, one celled, globular portions, seated on a common receptacle.

The *Spigelia* is a mucilaginous plant, with a mild and not very disagreeable taste. The infusion and decoction of the root and leaves afford a flocculent precipitate with alcohol. They are discoloured but not precipitated by silicated potash. They have little sensibility to gelatin, al-

though the tincture is made turbid by it. After the decoction was filtrated from the mucus, which had been coagulated by alcohol, it gave a precipitate with nitrate of mercury, but none with muriate of tin. Sulphate of iron caused a dark green precipitate from the decoction, and but little change in the tincture. No distinct evidence of resin presented itself. A substance which may perhaps be considered a variety of extractive matter, appears to exist in this plant, as the tincture was affected in nearly the same manner by the salts of tin and mercury above mentioned, as the filtrated decoction.

Water may be considered an adequate solvent for the chief proximate principles of this plant.

The medicinal reputation of the *Spigelia* is founded on the powers which it is supposed to possess as a vermifuge. This reputation is now so generally established, that the plant has become a considerable article of commerce to various parts of the world, from our southern states. This is a sufficient evidence, that the medicine has, to a certain extent, satisfied public expectation, and obtained the sanction of practitioners. But beyond this, it is difficult to speak confidently on the subject. The *Spigelia* belongs to a class of medicines, which are frequently prescrib-

ed, without positive proof of the existence of the cause which they are intended to remove ; which often fail altogether in the hands of the most successful practitioners ; which frequently succeed merely because they are backed with medicines of a more active class ; and whose apparent success is sometimes the consequence solely of a diseased state of the body.* Our plant is however entitled to trial, especially where it can be obtained fresh, and in full strength. A physician of the southern states, for whose opinion I have much respect, Dr. Norcom of Edenton, N. C. informed me some years since, that the *Spigelia* was

* From the list of equivocal anthelmintics, I would except those which have a cathartic operation, also a number of mineral origin. But I am fully persuaded, that many reputed vermifuges have enjoyed a reputation which they do not deserve. The *Dolichos pruriens* has received the commendations of practitioners and medical writers, on the presumption that its spiculæ exert the same stimulant effect on the bodies of worms in the alimentary canal, that they do on the human skin externally. I was long ago inclined to doubt the power of these spiculæ to withstand the digestive process of the stomach. My suspicions were confirmed upon finding that simple maceration in warm water for an hour, dissolves their virus, and renders them incapable of producing their usual stimulus of itching, when applied to the skin. Some late experiments by my pupil, Dr. Chandler, have shewn that the gastric juice destroys their activity in the same manner.

It is not necessary in this place to revert to the *Fern root* of Madame Nouffer, and various other exploded anthelmintics of its kind.

most active when recently dried, and that its efficacy was always impaired by keeping more than six months. Dr. Garden had previously made observations somewhat similar. If this be the case, we may account for its failures in the hands of those who obtain it at a distance when half a dozen years old.

Drs. Lining, Garden, and Chalmers of Carolina, are the writers who first introduced the *Spigelia* to notice, and who have spoken most unequivocally in its praise. Each of these physicians has represented it as an anthelmintic of superior efficacy. It appears that under certain circumstances, it is capable of operating as a cathartic, and that in these instances, the most advantage has been experienced from it. Dr. Garden says, that he had given it in hundreds of cases, and that he "never found it do much good except when it proved gently purgative." As the action of the *Spigelia* upon the bowels is quite uncertain, most practitioners either unite, or follow it with calomel or some purgative medicine.

We are told that the pink root, when in its most active state, if given in large quantities, induces narcotic symptoms, such as stupor, headach, dilated pupil, &c. Dr. H. Thompson, who took large doses of the root to try its effect on himself,

found that it produced an increased quickness of the pulse, drowsiness, flushing of the face and stiffness of the eyelids. Dr. Chalmers attributes to its too free use the cases of two children, who died in convulsions. Dr. Macbride informs us that its narcotic effects are seldom or never attended with danger, and that some physicians consider them an evidence of the favorable operation of the medicine. The opinion that this effect is owing to the root of some deleterious plant taken up with the *Spigelia*, seems to be void of foundation.

As in most other perennial plants, the root of the *Spigelia* possesses a greater share of activity than the herb. Of this root ten grains may be given in powder to a child four years old, twenty to one which is seven, and a drachm to an adult. If no inconvenience ensue, it may be repeated two or three times a day. If the infusion is preferred, an ounce of the root may be infused in a pint of water, and half the quantity taken by an adult or one or two spoonfuls by a child.

BOTANICAL REFERENCES.

Spigelia Marilandica, LINN. *Sp. pl.*—CURTIS, *Bot. Mag. t.* 80.—WOODVILLE, *ii. t.* 105.—WALTER, *Flor. Car.* 92.—MICHAUX, *i.* 147.—PURSH, *i.* 139.—ELLIOTT, *i.* 236.—*Lonicera*

spicis terminalibus, &c. GRONOV. *Virg.* 30.—Periclymeni Virginiani flore coccineo planta Marilandica, &c. CATESBY, ii. t. 78.

MEDICAL REFERENCES.

CHALMERS, on the weather and diseases of South Carolina, i. 67.—LINING, *Essays, phys. and lit.* i. 436. GARDEN, ditto, iii. 145.—HOME, *Clin. exper.* 420.—MURRAY, *App. Med.* i. 548—MACBRIDE, in *Elliott's Car.* 237.—THOMPSON, *Inaug. Diss.*

PLATE XIV.

Fig. 1. *Spigelia Marilandica.*

Fig. 2. The capsule with the reflected calyx.

Fig. 3. Corolla opened.

the following theorem. Let $f(x)$ be a function of x which is continuous in the interval $a \leq x \leq b$ and let $F(x)$ be the function defined by

$$F(x) = \int_a^x f(t) dt \quad (1)$$

then $F(x)$ is continuous in the interval $a \leq x \leq b$ and its derivative is $f(x)$. This theorem is a special case of the more general theorem which states that if $f(x)$ is continuous in the interval $a \leq x \leq b$ and if $F(x)$ is any function which satisfies the equation

$$F'(x) = f(x) \quad (2)$$

then $F(x)$ is continuous in the interval $a \leq x \leq b$ and its derivative is $f(x)$. This theorem is a special case of the more general theorem which states that if $f(x)$ is continuous in the interval $a \leq x \leq b$ and if $F(x)$ is any function which satisfies the equation

$$F'(x) = f(x) \quad (3)$$

then $F(x)$ is continuous in the interval $a \leq x \leq b$ and its derivative is $f(x)$. This theorem is a special case of the more general theorem which states that if $f(x)$ is continuous in the interval $a \leq x \leq b$ and if $F(x)$ is any function which satisfies the equation

$$F'(x) = f(x) \quad (4)$$

then $F(x)$ is continuous in the interval $a \leq x \leq b$ and its derivative is $f(x)$. This theorem is a special case of the more general theorem which states that if $f(x)$ is continuous in the interval $a \leq x \leq b$ and if $F(x)$ is any function which satisfies the equation

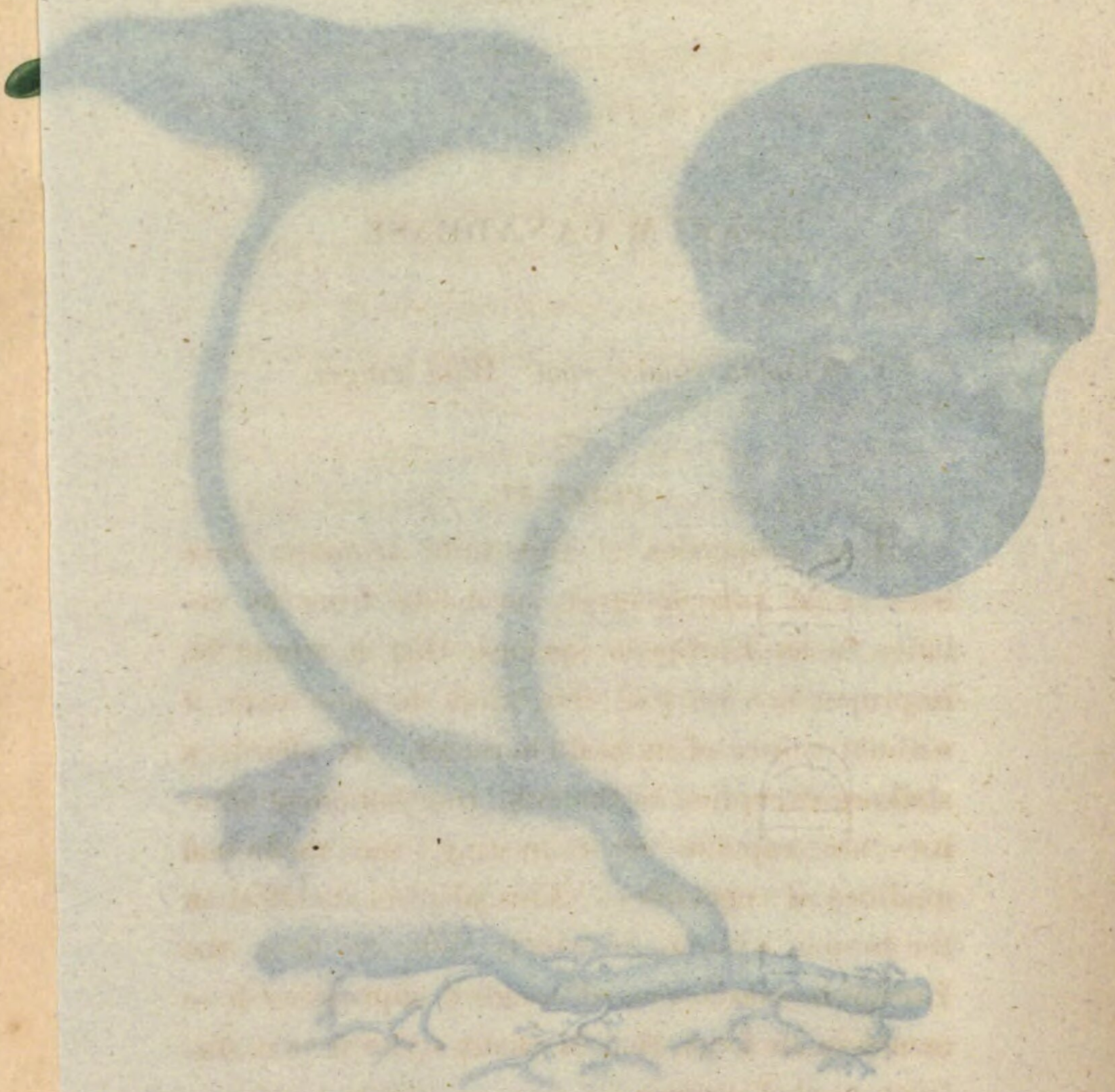
$$F'(x) = f(x) \quad (5)$$

then $F(x)$ is continuous in the interval $a \leq x \leq b$ and its derivative is $f(x)$. This theorem is a special case of the more general theorem which states that if $f(x)$ is continuous in the interval $a \leq x \leq b$ and if $F(x)$ is any function which satisfies the equation

PL. XV.



Asarum Canadense



Asplenium Canadense

ASARUM CANADENSE.

Canada Snake root. Wild ginger.

PLATE XV.

THE properties of this mild aromatic have been so far misconceived, probably from its relation to an European species, that it would be improper in a work of this kind, to pass over it without notice of its real character. It affords a striking exception to the rule, that botanical affinities are capable of indicating the medicinal qualities of vegetables. This plant in its effect on the human system, is widely different from the European asarabacca, although it approaches it so nearly in its form, that Michaux styles it "*vix distinctum ab Europæo.*"

The Asarum Canadense grows in old woods and mountainous tracts from Canada to Carolina. It is one of the humblest plants, presenting only two leaves with their stalks, which appear to constitute the whole of the plant above the ground.

On plucking the plant, the two leaves are found connected below, with an obscure flower in their fork, which had rested on the surface of the ground, or been buried under the decayed leaves and soil. Its flowering time is from May to July.

This plant, from the number of its stamens, is placed by Linnæus and Michaux in the class *Dodecandria*. Pursh, who has omitted this class in his Flora, has transferred the *Asarums* to *Gynandria*, from the circumstance that the stamens are inserted on the germ. This place however is not better suited to the *Asarum*, than to a multitude of other plants whose germ is inferior.

Linnæus' natural order for this plant is *Sarmentaceæ* and Jussieu's *Aristolochiæ*.

Generic character. *Calyx three or four cleft, superior; corolla none; anthers growing to the middle of the filaments. Capsule coriaceous, crowned.*

Specific character. *Leaves two, reniform; calyx woolly, cleft to the base; its segments spreading at top.*

The root of the *Asarum* is creeping, fleshy, and somewhat jointed. Leaves kidney shaped, pubescent on both sides, with long, round, hairy petioles. Flower solitary, growing from the fork of the stem, on a pendulous hairy peduncle. Ca-

lyx very hairy or woolly, consisting of three broad, concave leaflets, which are mostly of a brownish or dull purple on the inside at top and bottom, and terminated by a long, spreading, inflected point, with reflexed sides. The colour varies greatly according to the amount of light which the plant enjoys, being sometimes nearly green. Stamens twelve, inserted on the germ at a distance from the calyx, the alternate ones longer. Anthers growing to the filaments below their extremity. Near the divisions of the calyx are three short, curved, filamentary substances, which may perhaps be called nectaries. Germ inferior, somewhat hexagonal, marked at top inside with a dark red line; style conical, striate, parted at top into six recurved, radiating stigmas.

The root of the *Asarum* has an agreeable aromatic taste, which is intermediate between that of ginger and the *aristolochia serpentaria*. This quality has given it the names of *Wild ginger* and *Snake root* in different sections of the country. The name *Colt's foot* is also applied to it.

The chemical trials, to which I have subjected the root, bring to view the following substances:—

1. A light coloured, pungent, volatile oil, possessing the characteristic taste and smell of the plant in a high degree. 2. A resin, which is of a red-

dish colour and very bitter. These two constituents communicate to alcohol the active properties of the plant. 3. Fœcula. 4. A gummy mucus. These exist in such quantities as to impede the filtration of the decoction. Astringency hardly exists in this root, as a gelatinous solution gave no evidence of tannin, and the sulphate of iron produced a green colour hardly bordering on black.

It has been asserted, and the statement copied from one book to another, that the *Asarum Canadense* is a powerful emetic. I presume that subsequent writers have taken their opinion from Cornutus, who, in his plants of Canada, informs us, that two spoonfuls of the juice of the leaves of the *Asarum*, (meaning the European plant, rather than the American,) are found to evacuate the stomach powerfully. I can hardly doubt, that if such an operation has really been produced from the Canadian species, it must have taken place in irritable stomachs, to whom two spoonfuls of any crude vegetable juice would have proved emetic. Having seen the root of this plant used in the country in considerable quantities as a sudorific, I was long since induced to doubt its emetic power. Subsequent experience has satisfied me that the freshly powdered root, given to the extent of half a drachm, and probably in still

larger quantity, excites no vomiting nor even nausea.

Still however the plant deserves not to be discarded from use. The aromatic flavour of the root is more agreeable than that of the aristolochia serpentaria, which article it seems to resemble in its medicinal powers. Several country practitioners, who have employed it, have spoken to me favourably of its effect, as a warm stimulant and diaphoretic. As a substitute for ginger, in common domestic use, I know of no indigenous article which promises so fairly as this.

Alcohol is the proper solvent for the active properties of this plant. The tincture has a dark red colour, and a highly concentrated taste of the root.

BOTANICAL REFERENCES.

Asarum Canadense, LIN. *Sp. pl.*—MICHAUX, i. 279.—PURSH, ii. 596.—Asarum foliis reniformibus, mucronatis, binis, GRONOVIVUS, 72.—Asaron Canadense, CORNUTUS, *Canad.* 24, t. 25.—Asaron Americanum, PARKINSON, *theatr.* 266.

MEDICAL REFERENCES.

SCHUEPF, 72.—BART. *coll.* 26, 48.—COXE, *Disp.* 368.

PLATE XV.

Fig. 1. *Asarum Canadense*.

Fig. 2. *The germ with the stamens and nectareous filaments.*

Fig. 3. *A petal.*

Fig. 4. *A stamen a little magnified.*

Fig. 5. *Style and stigmas magnified.*



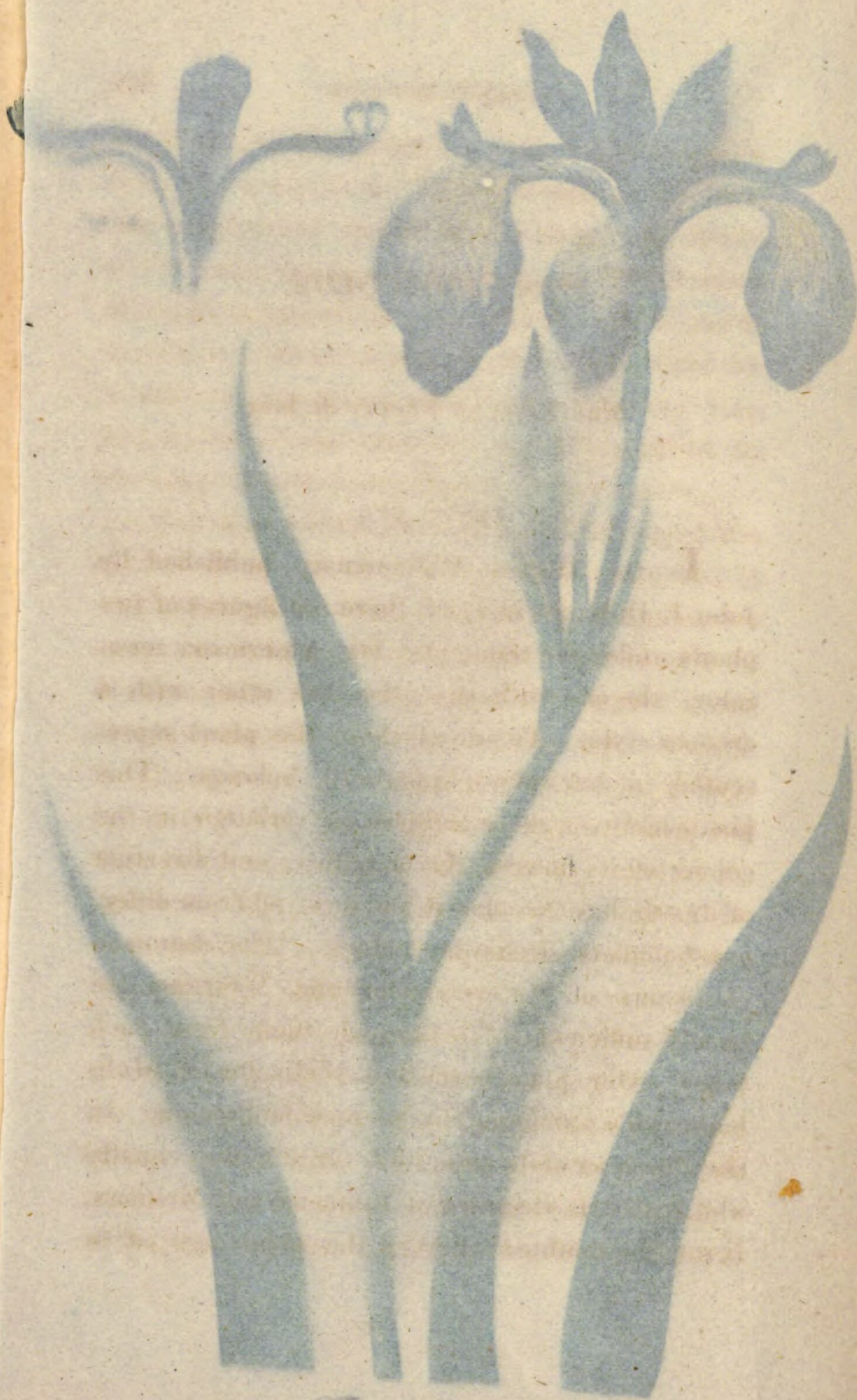
Iris versicolor

IRIS VERSICOLOR

Blue Flower or Flower de luce.

Number 274

In our former publication, published by John A. Miller, we gave the figures of two plants under the name of the *Iris versicolor*, the one with a blue flower and the other with a cream-colored style. It is now found that the plant represented in our plate is not the same. This plant however is so similar to the one in the colour of its flowers, the arrangement and direction of its stigmas, so that it has been called by different botanists different names. The common characters of *Iris versicolor* and *Iris virginica* are hardly sufficient to distinguish them from each other. Our plant is the *Iris versicolor* of Muhlenburgh's catalogue, by his own declaration. In the character of its stem however, it agrees equally well with *Iris virginica* of Linnæus and Michx. It may be doubted whether the plant figured in



This is a

IRIS VERSICOLOR.

Blue Flag, or Flower de luce.

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PLATE XVI.

IN the Hortus Elthamensis, published by John J. Dillenius in 1732, there are figures of two plants under the name of "Iris Americana versicolor," the one with an entire, the other with a crenate style. To one of these, the plant represented in our plate apparently belongs. This plant however is so subject to variation in the colour of its flowers, the crenatures and direction of its stigmas, &c. that it has received from different botanists dissimilar names. The Linnæan characters of Iris versicolor and Virginica are hardly sufficient to distinguish them from each other. Our plant is the Iris versicolor of Muhlenburgh's catalogue, by his own declaration. In the character of its stem however, it agrees equally well with Iris virginica of Linnæus and Michaux. It may be doubted whether the plant figured in

the Botanical Magazine, *t.* 703, is more than a variety of this species. The characters taken from the comparative length of the stem and leaves, of the inner petals and stigmas, and the direction of the stem and of the stigmas ; are all subject to variation. Michaux, Elliott and Pursh make the *Virginica* synonymous with *Iris hexagona* of Walter, which seems permanently distinguished by the deep furrows in the angles of its capsule.

The *Iris versicolor* is found throughout the United States in the borders of swamps and in wet meadows, of which it forms a principal ornament in the month of June. No race of vegetables can be better marked than the elegant genus to which this plant belongs. They are essentially distinguished by *a corolla, parted into six segments or petals, of which three are reflexed and three are erect. The stigmas resembling petals.* The species in our plate has *ensiform leaves, its stem acute on one side, its capsules oblong, three sided, with obtuse angles.*

Class *Triandria*,—Order *Monogynia*.—Natural orders, *Ensatae*, Lin. *Irides*, Juss.

The root is fleshy, horizontal, sending down a multitude of fibres. Stem two or three feet high, round on one side, acute on the other, frequently branched, and bearing from two to six flowers.

Leaves sword shaped, striated, sheathing at base. Bractes becoming scarious. Peduncles of various length, flattened on the inside. Germ three cornered, with flat sides and obtuse angles. Outer petals of the flower spatulate, beardless, the border purple, the claw variegated with green, yellow and white, and veined with purple. Inner petals erect, varying in shape from spatulate to lanceolate, usually paler than the outer, entire or emarginate. Style short, concealed; stigmas three, petal-form, purple or violet, resting on the outer petals, their extremities bifid, crenate, and more or less reflexed; their lower lip short. Stamens concealed under the stigmas, with oblong-linear anthers. Capsule three celled, three valved; when ripe, oblong, turgid, three sided, with roundish angles. Seeds numerous, flat.

The young leaves of this and some other species of *Iris*, afford an excellent view of the spiral filament, which lines the sap vessels of the leaf. If a leaf, which has just emerged from the ground, be carefully broken across, and the segments gradually drawn asunder, these fine filaments will unroll themselves, and their spiral structure become very obvious to the microscope.

The root of the *Iris versicolor* has a nauseous taste, and when swallowed or held in the mouth,

even in small quantities, it leaves behind a powerful sense of heat and acrimony in the fauces. Its most active chemical constituent appears to be a resin, which separates in the form of a white precipitate, when water is added to the alcoholic solution. The decoction suffers little or no change with alcohol, gelatin or salts of iron. Muriate of tin affects it slightly, the nitrate of mercury more abundantly. Its taste is much weaker than that of the tincture. Water distilled from the root has a highly nauseous taste and odour.

The root of the *Iris versicolor* given medicinally is an active cathartic. Mr. William Bartram, in his travels in Georgia and Florida, informs us, that on his arrival at Ottasse, an Indian town on the Tallapoosa, he found the natives "fasting, taking medicine, and praying, to avert a greivous calamity of sickness which had lately afflicted them, and laid in the grave abundance of their citizens. The first seven or eight days, during which time they eat or drink nothing, but a meagre gruel made of a little corn-flour and water; taking at the same time, by way of medicine or physic, a strong decoction of the roots of the *Iris versicolor*, which is a powerful cathartic. They hold this root in high estimation, and every town cultivates a little plantation of it, having a large artificial

pond just without the town, planted and almost overgrown with it."

Having myself formerly made use of this root in dispensary practice, I can bear testimony to its efficacy as a medicine, though not altogether to its convenience. A small quantity of the recent root, or a few grains of the root newly dried, are generally certain and active in their operation on the bowels. They are however apt to occasion a distressing nausea like sea sickness, with a prostration of strength of some hours' continuance; so that I think the plant will not be like to come into favor as a cathartic, at least when better ones are at hand. The activity of this article is diminished by age.

The stimulating properties of the Iris render it capable of exciting many of the secretions, as well as excretions. But I know of no purpose for which it seems better calculated, than that of a diuretic. The late Dr. Macbride of Carolina assured me, that he had found great benefit in dropsical affections from a decoction of the roots of this plant in combination with those of *Eryngium yuccifolium*. In consequence of his recommendation, I administered the tincture of the Iris in small doses to several persons affected with anasarca and with hydrothorax. It was evidently of

service to a majority of those who took it, for a certain time. That it did not always cure the disease, is a reproach which it must divide with diuretic remedies of much older celebrity.

The *Iris gracilis*, a species described in the *Florula Bostoniensis*, the *Iris pseudacorus* of Europe, and several others of the genus, appear to possess properties very similar to those of the plant described.

BOTANICAL REFERENCES.

Iris versicolor, LIN. *Sp. pl.*—DILLENIUS, *Elth. t.* 155.—CURTIS, *Bot. Mag. t.* 21, *a variety.*—PURSH, *i.* 29.—ELLIOTT, *Car. i.* 45. WALTER, *Car.* 67.

MEDICAL REFERENCES.

BARTRAM, *travels*, 454, *Lond. edit.*—CUTLER, *Mem. Amer. Acad.* 405—6.—MACBRIDE, *in Elliott's Car. i.* 45.

PLATE XVI.

Fig. 1. *Iris versicolor.*

Fig. 2. *Style and stigmas with a stamen.*

survive to a majority of those who took it, for every
one of them. That it did not always save the life
was a misfortune which it must divide with itself.
The first trial of each other's ability.

The first trial of each other's ability in the
Florida the Tennessee the first pendulum of the
ropes and several others of the group, apparent
possession of properties very similar to those of the
plants described.

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Hyoscyamus niger

Hebena is a small plant from the *Hydrophyllum* of
the *Hydrophyllum* group. It is not rare
in most parts of the country and appears to be
strictly limited by the amount of water. Its
seeds are very hard and will spring up
under favorable circumstances after having been
dormant for a long time. Hence the plant occa-
sionally appears in old grounds which have been
newly disturbed, as in grave yards, old gardens
and cellars. About ten years since, a drain, which
intersects the common in Boston, was opened for
the purpose of repairs. In the following season
a distinct row of very luxuriant plants of *Hebena*
covered the whole of this drain, although none of
them had been observed to grow in the vicinity

* For the drawing which accompanies this article, I am indebted
to Dr. S. Bass of Salem.



2.



Hydrocotyle niger

HYOSCYAMUS NIGER.

Henbane.

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PLATE XVII.*

THERE is little doubt that the *Hyoscyamus* of this country is an imported plant. It is yet rare in most parts of the country, and appears to be strictly limited to the bounds of cultivation. Its seeds are very tenacious of life, and will spring up under favourable circumstances, after having been dormant for a long time. Hence the plant occasionally appears in old grounds which have been newly disturbed, as in grave yards, old gardens and cellars. About ten years since, a drain, which intersects the common in Boston, was opened for the purpose of repairs. In the following season a distinct row of very luxuriant plants of *Henbane* covered the whole of this drain, although none of them had been observed to grow in the vicinity

* For the drawing which accompanies this article, I am indebted to Dr. S. Bass of Salem.

the preceding year. The seeds, which produced these plants, had probably been buried for more than fifteen years.

This species, together with others of its genus, was well known to the ancients under the same name which it now bears. Its medicinal and deleterious properties were also understood by them.

In modern arrangements the *Hyoscyamus* is common with *Datura*, *Atropa* and other injurious vegetables of its kindred, is found in the class and order *Pentandria Monogynia*, and the natural order *Luridæ*. Its *Jussieuean* order is *Solanææ*.

In this genus the *corolla* is *funnel shaped* and *obtuse*, the *stamens* *inclined*, the *capsule* *two celled* and *covered with a lid*.

The present species has the *lower leaves sinuated* and *clasping*, and the *flowers sessile*. It is *biennial* and flowers in *June* and *July*.

The whole herb has a *glaucous* or *sea green* colour, is *hairy* and *viscid*, and emits a *rank*, *offensive* smell. The stalk is *one or two feet high*, *round*, *branching* and *rigid*. The first leaves *spread upon the ground*, and have some resemblance to a *young thistle*. They are *large*, *oblong*, frequently *contorted*, *clasping*, cut into

acute lobes, and pointed ; the upper ones generally entire.

The flowers form a revolute, one sided spike at the end of the stem or branch, leaving, as they fall off, a straight row of capsules. The calyx has five short acute segments. The corolla is funnel shaped, irregular, with five spreading, obtuse segments, of a pale yellow or straw colour, with a beautiful net work of purple veins. Stamens inserted in the tube of the corolla, with large oblong anthers. Style slender, longer than the stamens, declined, with an obtuse stigma. Capsule two celled, roundish, covered with a lid, and invested with the persistent calyx, the segments of which extend beyond the calyx, and become rigid and prickly. The seeds are numerous, small, unequal, brownish, and are discharged by the horizontal separation of the lid.

From such chemical experiments as I have made with the dried leaves of the *Hyoscyamus*, I am inclined to believe, that their chief soluble portion is a variety of extractive matter. The watery and alcoholic solutions do not disturb each other, and the usual tests of tannin produce inconsiderable, or no alteration in either. Of various metallic salts which affected the solutions, the

nitrate of mercury gave the largest precipitate in my experiments.

The Hyoscyamus has long been known as a narcotic poison. This character it uniformly exerts in regard to mankind, although many brute animals are exempt from its influence.* Dioscorides speaks of it as producing drowsiness and delirium.

* Horses, goats, sheep and swine are said to eat it without injury. Brute animals are frequently less susceptible of the influence of poisons than mankind. In the experiments which have been made on them to test the effect of doubtful medicines, the positive evidences of activity which they furnish, are in general more to be depended on, than the negative. That is, if an animal suffers from the action of any substance, a man would be like to suffer somewhat in the same way. Yet if the animal escapes with impunity, it does not follow that the man would be equally fortunate. There is scarcely any narcotic plant which is not devoured by some species of quadruped. Professor Pallas has stated, that the hedgehog can devour Cantharides by hundreds without inconvenience, whereas one of these insects may occasion serious trouble to a man. The following case happened under my own observation. A large eagle, (*Falco ossifragus*,) intended for a cabinet of natural history, was subjected to a variety of experiments, with a view to destroy him without injuring his plumage. A number of mineral poisons were successively given him without effect, even in large doses. At length a drachm of corrosive sublimate of mercury was inclosed in a small fish and given him to eat. After swallowing the whole of this, he continued, to appearance, perfectly well and free from inconvenience. The next day an equal quantity of arsenic was given him without any better success. So that in the end, the refractory bird was obliged to be put to death by mechanical means.

The instances recorded of deleterious consequences, ensuing from the *Hyoscyamus* incautiously taken, are exceedingly numerous. In a number of cases the roots have been introduced by mistake among culinary vegetables, and have occasioned alarming symptoms in whole families at once. In a case cited by Wepfer, the monks of a whole monastery, in consequence of some roots being boiled among those of chicory with their food, were seized with raving delirium, accompanied by intense thirst, impaired vision and other violent affections. Dr. Patouillat has recorded in the *Philosophical Transactions*, vol. 40, the case of nine persons, who were affected with loss of speech, convulsions, and at length with violent delirium. These symptoms subsided on the subsequent day, when it was found that some roots of Henbane had been dug up in the garden the preceding day by mistake for parsnips, and boiled in the soup on which the family had dined. Sir Hans Sloane, in the same *Transactions* for 1733, has given an instance of effects equally dangerous, occurring in some children who ate the capsules of this plant, supposing them to be filberds. Even the odour of this noxious vegetable seems capable of exciting its characteristic effects. In a case cited by Murray from the

Gazette de Sante of 1773—4, some servants who slept in a barn, where the Henbane had been scattered for a defense against rats, awoke with head-ach, dizziness and vomiting.

In instances where death has ensued from swallowing this plant, the stomach has been found to exhibit marks of inflammation, and dark or gangrenous spots.

The principal use which is made of *Hyoscyamus* in medicine, is as a substitute for opium, in cases where that article disagrees with the patient, or is contraindicated by particular symptoms. It appears to be free from the constipating qualities of opium, and in some instances it is found to fulfil the indications which call for an anodyne and soporific remarkably well. Among medical writers who have spoken favourably of its operation are Dr. Whytt, who employed it in various nervous diseases, and Mr. Burns, author of different obstetric works, by whom it is recommended as preferable to opium in certain puerperal complaints. Mr. Benjamin Bell states, that he found great advantage from its use in troublesome cases of chordee, after opium had failed to give relief.

It must be acknowledged however, that *Hyoscyamus* is far less uniform and equal in its opera-

tion than opium, and that although in some constitutions it mitigates pain, quiets irritation, and procures sleep; yet in others it produces unpleasant nausea, confusion of ideas, head-ach, and sleep which is laborious and unrefreshing. It is rather a secondary medicine, to be resorted to after the failure of opium, than one which we may confidently apply to at first, with reliance on its anodyne effects.

The Henbane was found efficacious in the disease of colica pictorum by Stoll and several others. Its external application in the form of a cataplasm of the bruised leaves has given relief in various tumors and painful affections.

For internal use the extract should be prepared in the same way as that of stramonium. From one to three grains of this extract is a suitable commencing dose, which may be gradually increased until its effects are perceived.

BOTANICAL REFERENCES.

Hyoscyamus niger, LINN. *Sp. pl.*—WOODVILLE, i. t. 52.—SMITH, *Engl. Bot. t.* 591.—PURSH, i. 141.—*Hyoscyamus flavus*, FUCHSIUS, *Hist.* 791.—*Hyoscyamus vulgaris*, BAUHIN, J. iii. 627.

MEDICAL REFERENCES.

STOLL, *ratio med.* iii. 13, 423.—CULLEN, *Mat. Med.* ii. 271.—FOTHERGILL, *Med. Soc. Lond.* i. 310.—HOME, *clinical exp'ts*,

197.—WITHERING, *Med. Comment. Dec. II, vi.* 367.—KING-
LAKE, *Lond. Med. and Phys. Journal*, v. 438.—BROWN, *ditto*, iii.
406.—MURRAY. *App. Med.* i. 655, &c. &c.

PLATE XVII.

Fig. 1. *Hyoscyamus niger*.

Fig. 2. Corolla laid open.

Fig. 3. Calyx.

Fig. 4. Calyx of the fruit laid open to shew the capsule within it.

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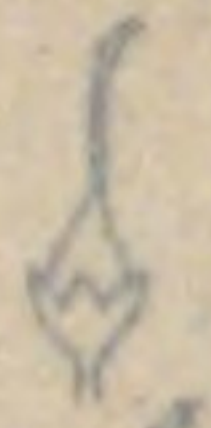
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5.

Solanum dulcamara

is originally of American growth, but has been introduced into the country of the present. It is now cultivated in the West. It is a very hardy vegetable, and although its natural soil is at the water side, yet it readily becomes habituated to shady, fertile ground of almost any elevation. The most luxuriant productions are found about brooks and streams and in sheltered situations, where the roots have free access to water. In these places the stalks frequently extend some way on the surface, sending down a multitude of radicles into the soil below. When the plant grows in higher ground and more exposed to the light, its growth is restricted, and the flowers are less brilliant in colour.



Solanum dulcamara

SOLANUM DULCAMARA.

Bitter sweet.

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PLATE XVIII.

WHETHER the plant represented in our plate is originally of American growth, or has been introduced since the discovery of this continent, it is now difficult to say. It is certainly a hardy vegetable, and although its natural soil is at the water side, yet it easily becomes habituated to shady, fertile ground of almost any elevation. The most luxuriant specimens are found about brooks and ditches and in sheltered situations, where the roots have free access to water. In these places the stalks frequently extend some way on the surface, sending down a multitude of radicles into the mud below. When the plant grows in higher ground and more exposed to the light, its growth is restricted, and the flowers are less brilliant in colour.

The names of *Bitter sweet* and *Woody nightshade* are the most frequent English appellations of this vegetable. The former of these is also applied to the *Celastrus scandens*, a very different plant. The frequent changes which always take place in the application of vulgar names, renders a reliance on them unsafe, and indeed makes it useless to collect or preserve more than a few of the principal ones.

The genus *Solanum* is remarkable for the great variety and almost opposite character which takes place among its species. The common Potatoe, the Egg plant, the Tomato, the Jerusalem cherry, and the Black nightshade, are all species of this multiform genus. The common character which binds them together, consists in *a rotate corolla; the anthers cohering, with a double opening at top; the berry two celled*. The species *Dulcamara* is distinguished from others by *its stem, which is shrubby; unarmed and flexuous; its leaves auriculated; and its panicles resembling cymes*.

Class *Pentandria*,—Order *Monogynia*,—Natural orders *Luridæ*, Linn. *Solanææ*, Juss.

The *Bitter sweet* is entitled to the character of a vine rather than shrub. The stem is woody, slender, climbing in large plants to the height of

five or six feet. Leaves petioled, ovate, acute, entire, furnished at the base with two appendages, which give them somewhat of a hastate form. The lower and upper leaves are frequently without these appendages. The flowers form a loose, nodding cluster or panicle, shaped like a cyme, and taking its origin opposite to a leaf. Calyx of five short, purplish, persistent segments. Corolla rotate, becoming reflexed as it grows old, divided into five acute segments, which are purple, and marked with two whitish dots at the base of each. The filaments are much shorter than the anthers, and inserted in the short tube of the corolla. Anthers yellow, erect, cohering, so as to form a conical tube around the style. Germ oval; style longer than the stamens; stigma simple. The berries are oval, of a bright scarlet colour, and continue to hang in bunches after the leaves have fallen.

The taste and smell of the *Dulcamara* are less nauseous than those of many other species of *Solanum*. Water seems a perfect solvent for its most sensible constituents. The chief soluble portion seems to be a kind of mucous extractive, which is taken up by both water and alcohol, though most by the former. The nitrate of mercury and muriate of tin, gave precipitates from

both, though most from the water. The chemical evidences of astringency were very slight.

From the experiments of Hartmann and Kuhn, cited by Murray, we may infer that water is a better solvent for this plant than alcohol. An ounce of the twigs or stalks treated with alcohol afforded two drachms and two scruples of extract. The same quantity treated with water gave three drachms and thirty five grains.

The *Solanum dulcamara* has formerly received the commendations of many authors, some of whose names are of high authority in medicine. The diseases in which it has acquired confidence, are chronic rheumatism, gout, secondary syphilis, incipient phthisis, asthma, jaundice. But whatever may be its efficacy in these complaints, it has in modern practice given place to more active medicines. Its most permanent and merited reputation at the present day, is derived from its application to external complaints, and particularly to cutaneous diseases. In dissertations upon the properties of this plant by Linnæus and by Carriere, its use is highly commended in herpes, in scabies, and in some of the secondary forms of syphilis. Professor Murray has added his own testimony to that of these writers, and speaks de-

cisively of his success with it in cutaneous diseases of an inveterate character.

In the more recent and splendid works of Willan and Bateman on Diseases of the Skin, we find some important testimony of the efficacy of the *Dulcamara* in cutaneous affections. The former of these authors has inserted in his work a letter of Dr. Crichton, physician to the Westminster hospital, who had employed the article for a considerable number of years. This gentleman states, that out of twenty three cases of *Lepra Græcorum*, in which he had used it, two only had resisted its action. He does not assert that it is equally efficacious in other cutaneous diseases, although it had appeared to him to do good in psoriasis and pityriasis. His mode of employing it was as follows :

Take of stalks of *Dulcamara*, one ounce ; water, a pound and a half ; boil to a pound, and strain when cold.

Of this decoction the patient took two ounces at first, morning, noon and night, but the quantity was afterwards increased, until it amounted to a pint per day. At the same time the skin was ordered to be washed with a stronger decoction, which proved an auxiliary to the cure. Dr. Crichton found that in delicate people and hyster-

ical women, it often produced syncope and slight palpitation of the heart, now and then nausea and giddiness. But if the dose was diminished, or any aromatic tincture added, it ceased to produce uneasy symptoms. The good effects of the remedy were seldom perceived until after the first eight days.

Dr. Bateman considers, that "one of the most effectual remedies for lepra under all its varieties is the decoction of the leaves and twigs of the *Solanum dulcamara*." He administers it in the same way with that just described. "When," says he, "there is a degree of torpor in the superficial vessels, the same decoction made with a larger proportion of the shrub, is advantageously employed as a lotion; but if there is any inflammatory disposition, this and every other external stimulus must be prohibited."

I have employed the Bitter sweet, both in substance and in decoction in a number of cutaneous affections. It appears to be a valuable auxiliary to mercury in the treatment of syphilitic eruptions. I have also known herpetic eruptions to yield to its internal and external use. The American plant however, when gathered in full vigour, does not set easily on the stomach in large doses. I have known vomiting produced by a few grains

of the powdered leaves, and by a small cup of the decoction. The strength of the plant seems to vary in some degree with the time of gathering, and mode of preserving. Dr. Cullen found different parcels of the article to exhibit very different degrees of strength. Writers are not agreed as to its immediate effects on the head and stomach, probably from the different age and condition of the medicine employed by them. From my own observation I am induced to consider the appearance of slight narcotic symptoms, as an evidence of the goodness of the medicine, and as a criterion for regulating the dose. The formula of Dr. Crichton for the decoction appears to be a good one, but in the case of delicate constitutions, the commencing dose should not exceed an ounce, which may be afterwards increased according to circumstances. The addition of a little cinnamon renders the decoction less apt to offend the stomach.

BOTANICAL REFERENCES.

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PLATE XVIII.

Fig. 1. *Solanum dulcamara*.

Fig. 2. *Corolla*.

Fig. 3. *Tube of anthers laid open*.

Fig. 4. *Stamen*.

Fig. 5. *Calyx and pistil*.

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METHODS OF RESEARCH

There are two main methods of research in medicine, namely the experimental and the clinical. The experimental method is that in which the investigator deliberately produces a disease or a condition in a subject, and then observes the effects of a treatment. The clinical method is that in which the investigator observes the effects of a treatment in a subject who has a disease or a condition.

The experimental method is the more scientific of the two, and is the one which is most commonly used in the laboratory.

The clinical method is the more practical of the two, and is the one which is most commonly used in the hospital.

Both methods are essential to the progress of medicine, and each has its own special value.

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Fig. II.

Fig. 1.

Fig. III.

Lobelia inflata

LOBELIA INFLATA.

Indian tobacco.

Native name.

In the United States there are many species of *Lobelia*, which are valued for their beauty, singularity of form. The most beautiful plants more elegant than the *Lobelia inflata*, and far more curious in structure than the *Lobelia Dortmunda*. In medicinal powers, the subject of this article is entitled to take precedence of the rest. It is an annual plant, found in fields and road sides, from Canada to the southern states. It flowers from midsummer until the arrival of frosts.

The genus *Lobelia* has a five cleft calyx, a monopetalous, irregular corolla, with a cleft tube, the anthers cohering; the capsule two or three celled.

The species *inflata* is branching and hairy, with ovate, serrate lobes, and turgid capsules.



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Lobelia inflata

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LOBELIA INFLATA.

Indian tobacco.

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PLATE XIX.

IN the United States there are many species of *Lobelia*, which are interesting for their beauty, singularity or use. We have few plants more elegant than the cardinal flower, and few more curious in structure than the *Lobelia Dortmanna*. In medicinal powers, the subject of this article is entitled to take precedence of the rest. It is an annual plant, found in fields and road sides, from Canada to the southern states. It flowers from midsummer until the arrival of frosts.

The genus *Lobelia* has a *five cleft calyx*; a *monopetalous, irregular corolla, with a cleft tube*; the *anthers cohering*; the *capsule two or three celled*.

The species *inflata* is *branching and hairy, with ovate, serrate leaves, and turgid capsules*.

The connexion of the anthers into a tube has caused some ambiguity and difference of opinion, as to the place which this genus should occupy, in the Linnæan system. Linnæus placed it in his order Monogamia of the class Syngenesia. Most of our late botanists have very properly removed the plants of this order from the compound flowers, with which they have no natural affinity, to *Pentandria*, which place their number of stamens authorizes them to occupy. Pursh has placed the Lobelias under Monadelphina. The Natural order which contains them is the *Campanaceæ* of Linnæus and Jussieu.

The *Lobelia inflata* varies in height from six inches to two or three feet. The small plants are nearly simple, the large ones much branched. Root fibrous. Stem erect, in the full sized plant much branched, angular, very hairy. Leaves scattered, sessile, oval, serrate, veiny and hairy. Flowers in spikes or racemes, pedunculated, each one in the axil of a small leaf. Segments of the calyx linear, acute, standing on the germ, which is oval and striated. Corolla bluish purple, the tube prismatic and cleft above, the segments spreading, acute, the two upper ones lanceolate, the three lower ones oval. Anthers collected into an oblong, curved body, purple; filaments

white. Style filiform ; stigma curved and inclosed by the anthers. Capsules two celled, turgid, oval, compressed, ten angled, covered with the calyx. Seeds numerous, small, oblong, brown.

The *Lobelia inflata* when broken, emits a milky juice. When chewed, it communicates to the mouth a burning, acrimonious sensation, not unlike the taste of green tobacco. It exhibits the following noticeable ingredients upon chemical examination. 1. An acrid principle. This is evident to the taste in the tincture, decoction, and distilled water. 2. Caoutchouc. Sulphuric ether dissolves more of the plant than alcohol, and acquires a higher colour. The solution in alcohol is scarcely rendered turbid by water, that in ether is disturbed by alcohol, and grows thick as the ether evaporates. 3. Extractive. No gummy or astringent qualities were manifested in my experiments.

The great acrimony of the leaves and capsules, combined with a narcotic property, appears to be the foundation of their medicinal power. Dr. Cutler informs us, that if the leaves be held for some time in the mouth, they produce giddiness and pain in the head, with a trembling agitation of the whole body, and at length bring on nausea and vomiting. These effects are analagous to

those, which the chewing or smoking of tobacco occasions in persons unaccustomed to its use.

When swallowed in substance, it excites very speedy vomiting, accompanied with distressing and long continued sickness, and even with dangerous symptoms, if the dose be large. A melancholy instance of death, occasioned by the use of this plant, in the hands of a quack, is detailed in the sixth volume of the Massachusetts Reports, in the trial of Samuel Thomson, an empiric practising in Beverly, for the murder of Ezra Lovett. In this trial it appeared, that the patient, being confined by a cold, sent for the pretended physician, who gave him three powders of Lobelia in the course of half an hour, each of which vomited him violently, and left him in a great perspiration during the night. The next day two more powders were administered, each of which operated by vomiting and occasioned great distress. In like manner two other powders were given the subsequent day, leaving the patient in a state of great prostration. Several days after this, the physician came again, and finding his patient still worse, administered several more powders, which occasioned great distress, and at length ceased to operate. Finding that the stomach was not sensible to the emetic effect of the Lobelia,

the physician repeated the dose, and when the patient complained of great distress at the breast and said he was dying, the doctor assured him the medicine would soon get down, or operate as a cathartic. However, on the same evening, the patient lost his reason and became convulsed, so that two men were required to hold him. To relieve which, the doctor forced down two more of his powders, and the patient, as was to be expected, grew worse, and continued so until he expired.

The doctor, who had thus terminated the disease and the patient at once, was arrested and put upon trial for murder ; but the homicide proving a legitimate one from the want of sufficient evidence of malice propense, he was acquitted and set at liberty.

From the violence of its effects, and the distressing nausea which it occasions, it is probable that the Lobelia will never come into use for the common purposes of an emetic, while other emetics can be obtained. It has however been found to exert a beneficial influence on particular diseases, and on this account is entitled to a place in the Materia Medica. Dr. Cutler, and a number of physicians in Essex county and elsewhere, have found benefit from its use in asthma, some in doses of a table spoonful of the saturated tincture,

others in doses of a teaspoonful. Indeed the former dose appears to be a very large one, and greater than most stomachs would bear with impunity. I have tried this medicine in several cases of asthma with some advantage. It has not however in general succeeded in affording relief of the paroxysm, until full vomiting was produced, which effect, with me, has happened after taking one or two teaspoonfuls.

A communication from Dr. Cutler, on the operation of this plant, is inserted in Dr. Thacher's Dispensatory. The venerable writer having himself suffered from asthma for ten years, had, during the paroxysms, resorted to many medicines for relief, without experiencing much benefit from any. He was at length induced to make trial of a tincture, prepared by himself from the *Lobelia inflata*. "In a paroxysm," says he, "which perhaps was as severe as I had ever experienced; the difficulty of breathing extreme, and after it had continued for a considerable time, I took a table spoonful. In three or four minutes my breathing was as free as it ever was, but I felt no nausea at the stomach. In ten minutes I took another spoonful, which occasioned sickness. After ten minutes I took a third, which produced sensible effects upon the coats of the stomach, and a

very little moderate puking, and a kind of prickly sensation through the whole system, even to the extremities of the fingers and toes. But all these sensations very soon subsided, and a vigour seemed to be restored to the constitution, which I had not experienced for years. I have not since had a paroxysm, and only a few times some small symptoms of asthma. Besides the violent attacks, I had scarcely passed a night without more or less of it, and often so as not to be able to lie in bed. Since that time I have enjoyed as good health, as perhaps before the first attack."

Dr. Cutler considers his disease to be what Dr. Bree in his "Practical inquiries on disordered respiration" calls the first species, "an asthma from pulmonic irritation of effused serum."

Dr. Randall informs me, that he has given the Lobelia to many persons of different ages suffering from asthma and catarrh, and with considerable variation in the form and degree of the dose. In asthma he finds it as successful as any article he has tried. When given in doses of a drachm of the saturated tincture, and two or three times repeated at convenient intervals; also in the form of other preparations of similar strength, he has found it usually to remove the paroxysm in a short time, and to restore the patient to qui-

etude and ease. In catarrh, when given in small doses and frequently repeated, it has operated as a sure and speedy expectorant, producing effects in their most important character, very similar to those of antimony and squills. Dr. Randall has not observed any narcotic effect to ensue from moderate doses, nor found it to produce irritation of the coats of the bladder, as has been suggested by some practitioners. In his hands it has not produced any more unpleasant consequence than frequent nausea, and occasional emesis, with a copious flow from the glands of the mouth.

Dr. Bradstreet of Newburyport acquaints me, that besides asthmatic cases, he has given the saturated tincture in two or three instances of dyspepsia, also in some cases of a rheumatic nature with beneficial consequences.

He considers its sensible effects to be very like those of common tobacco, but its medicinal action more speedy and diffusible, and of shorter duration. He thinks that it affects those accustomed to the use of tobacco as readily as others.

The Lobelia has been recommended as a remedy in hooping cough and croup. In the former of these complaints, I can say nothing of its use from experience, but in the latter disease I am

persuaded, it affords no benefit, having seen it largely tried by different practitioners in a number of fatal cases, where it only produced a distressing nausea, without, in any degree, facilitating the respiration, or relieving the disease.

The active properties of the Lobelia are readily extracted both by water and alcohol. The tincture however is most easily kept, and is the most convenient form for exhibition. The Essex district medical society have recommended a formula for this composition, which directs two ounces of the dried plant to be digested in a pint of diluted alcohol. Of this tincture, a teaspoonful given to an adult, will generally produce nausea, and sometimes vomiting. In certain instances however, much larger doses have been given, without producing any other effect than a flow of saliva.

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CUTLER, *Mem. Amer. Acad.* i. 484.—SCHCEPF, 128.—BART. *Col.* 36, 56.—THACHER, *Disp.* 267.—*Massachusetts Reports*, vol. vi.

PLATE XIX.

Fig. 1. *Lobelia inflata*.

Fig. 2. Corolla with the stamens projecting from the cleft in the upper side.

Fig. 3. Capsule cut across.

PLATE XIX

Fig. 1. Lobelia inflata.

Fig. 2. Corolla with the stamens projecting from the left of the upper side.

Fig. 3. Corolla and stamens.



2.

Solidago odora

3.

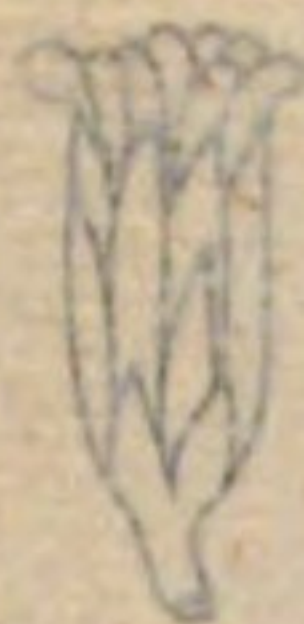
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SOLIDAGO ODORA.

Spice-scented Golden rod.

PALEA, 18.

This plant is common in the United States is so common in the autumn months, and at the same time so difficult to the botanist as to be difficult to distinguish from the numerous and familiar species of Aster. Each of these groups contains well defined species, sufficient to be distinguished by their external characters, such as position, color and place of growth. But between these is a multitude of subspecies, which in various external circumstances, changing their appearance with their places of growth, and coming together by so many points of resemblance, that it is a labor yet remaining for botanists to separate those species which are in nature distinct, from those which are varieties only.



2.

Solidago odora



3.



4.

SOLIDAGO ODORA.

Sweet scented Golden rod.

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PLATE XX.

No part of vegetation in the United States is so conspicuous and gaudy in the autumnal months, and at the same time furnishes to the botanist so difficult a task of discrimination, as the multitudinous and Protean genera *Solidago* and *Aster*. Each of these genera contains many well defined species, sufficiently marked by their external characters, sensible qualities, habits and places of growth. But between them, is a great multitude of subspecies, liable to variation from external circumstances, changing their appearance with their places of growth, and running together by so many points of resemblance, that it is a labour yet remaining for botanists to separate those species which are in nature distinct, from those which are varieties only.

The genus *Solidago* is characterized by a *naked receptacle, the down simple, rays of the corolla about five, scales of the calyx imbricated and close.* It is a very natural genus, easily distinguished at sight by its crowded tufts of compound flowers, which are almost always of a deep golden yellow.*

The species *odora* has its *stem nearly smooth, leaves linear-lanceolate, entire, smooth, with a rough margin, and covered with pellucid dots. Racemes panicled, one sided.*

Class *Syngenesia*,—Order *Superflua*,—Natural orders *Compositæ*, Lin. *Corymbiferae*, Juss.

The sweet scented Golden rod grows in woods and fields throughout the United States, and flowers in September. It has a smooth appearance, and is among the smaller species of its family. The root is woody, much branched and creeping. Stem slender, from two to three feet high, smooth or slightly pubescent below, pubescent at top. The leaves are linear-lanceolate, closely sessile, broad at base, entire, acute, with only the midrib distinct, rough at the margin but otherwise smooth, and covered with pellucid dots, like *Hypericum perforatum*. The flowers grow in a compound, panicled raceme, with each of its branches

* The only exception which I now recollect is *Solidago bicolor*, whose ray is white.

supported by a small leaf. These branches or peduncles are very slender and rigid, each giving off a row of ascending, downy pedicels, with small, linear bractes at their bases. Scales of the calyx oblong, acute, smooth, or slightly pubescent, the lower ones shorter and closely imbricating the rest. Florets of the ray few, with oblong, obtuse, ligules. Those of the disc funnel shaped, with acute segments. Down simple to the naked eye, feathery under the microscope. Seeds oblong.

This plant is the *Solidago odora* of Muhlenberg, and agrees with the character of Aiton. The *Solidago odora* of Michaux is possibly a different species. Willdenow's plant was undoubtedly different. The *folia puncticulosa*, which constitutes so distinct a mark in this species, I have not seen noticed by any botanist.

The leaves of the *Solidago odora* have a delightfully fragrant odour, partaking of that of anise and sassafras, but different from either. When subjected to distillation, a volatile oil, possessing the taste and aroma of the plant in a high degree, collects in the receiver. This oil apparently has its residence in the transparent cells, which constitute the dotting of the leaves, for the root is wholly destitute of the peculiar fragrance of the herb, and has rather a nauseous taste. This is contra-

ry to the remark of Willdenow, who informs us that the root is the fragrant part possessing the scent of *Geum urbanum*.

As the volatile oil appears to possess all the medicinal value of this plant, I have not prosecuted its chemical investigation any farther.

The claims of the *Solidago* to stand as an article of the *Materia Medica* are of a humble, but not despicable kind. We import and consume many foreign drugs which possess no virtue beyond that of being aromatic, pleasant to the taste, gently stimulant, diaphoretic and carminative. All these properties the Golden rod seems fully to possess. An essence made by dissolving the essential oil in proof spirit, is used in the eastern states as a remedy in complaints, arising from flatulence, and as a vehicle for unpleasant medicines of various kinds. I have employed it to allay vomiting, and to relieve spasmodic pains in the stomach of the milder kind, with satisfactory success. From its pleasant flavour, it serves to cover the taste of laudanum, castor oil, and other medicines, whose disagreeable taste causes them to be rejected by delicate and irritable stomachs.

Mr. Pursh informs us, that this plant when dried, is used in some parts of the United States as an agreeable substitute for tea. He further states,

that it has for some time been an article of exportation to China, where it fetches a high price.

BOTANICAL REFERENCES.

Solidago odora, AITON, *Hort. Kew.* iii. 214.—PURSH, ii. 539.
—*Virga Aurea Americana*, TARRACONIS facie et sapore, panicula speciosissima? PLUKENET, *Alm.* 389, t. 116, f. 6.

PLATE XX.

Fig. 1. *Solida odora*.

Fig. 2. *A flower magnified.*

Fig. 3. *A floret of the ray.*

Fig. 4. *A floret of the disc.*

NOTES.

Note A.

Most European writers seem to consider the *Datura stramonium* as a native of America. In Miller's Dictionary by Martyn, the editor says, "That it is a native of America, we have the most undoubted proofs, for in earth brought with plants from various parts of that extensive country, we are sure to have the Thorn apple come up. Kalm says, that it grows about all the villages, and that this and the *Phytolacca* are the worst weeds there. Our old writers call it Thorny Apples of Peru."

This evidence however is by no means sufficient. The plant appears in earth and ballast, carried from either continent alike. The name Apple of Peru has also been applied to *Datura metel*, a plant of Africa and the East Indies.

Note B.

In the Catalogue of plants in the Botanic garden at Calcutta, published in 1814, a species is inserted by the name of *Datura Tatula*, said to be a native of the Cape of Good Hope. This is probably different from the *Datura Tatula* of Linnæus.

Note C.

"The Jamestown weed, (which resembles the thorny apples of Peru, and I take it to be the plant so called,) is supposed to be one of the greatest coolers in the world. This being an early plant, was gathered very young for a boiled sallad, by some of the soldiers sent thither to quell the rebellion of Bacon; and some of them ate plentifully of it, the effect of which was a very

Bigelow, Jacob

American Medical Botany being a Collection of the Native medicinal Plants
of the United States, containing their Botanical History and Chemical
Analysis ...
Bd.: 1,2

Boston [1817]

M.med. 121 m-2

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